

**COLLABORATION BETWEEN RESEARCHERS AND BIOSPHERE RESERVE
PRACTITIONERS: A CASE STUDY OF REDBERRY LAKE BIOSPHERE RESERVE,
CANADA**

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ABSTRACT

Biosphere reserves (BRs) are UNESCO designated sites, established to promote and demonstrate the concept of sustainable development with the help of the local community and directed scientific research. Research is being conducted in and about the BRs, which brings researchers and BR practitioners together in order to achieve mutual goal(s). The challenge is to understand how to achieve effective collaboration. This thesis uses the theory of collaborative management in order to investigate opportunities and challenges faced in a collaborative process.

The purpose of the study was to understand how researchers and BR practitioners could collaborate effectively in order to achieve BR objectives. The case study used in this research was Redberry Lake Biosphere Reserve, located in Saskatchewan, Canada.

Factors of collaboration were identified, based on the literature reviewed and interviews conducted. A qualitative research approach was further used to collect data through the semi-structured interviews with researchers and BR practitioners who worked together under one initiative. Three initiatives that were evaluated represented the functions of a BR – sustainable development, biodiversity conservation, and logistic support.

This study generated a list of factors of collaboration necessary for the successful collaboration between researchers and BR practitioners. Many factors have already been practiced during the implementation of the initiatives. Yet there is a need to bring awareness about the functioning of BRs to external agencies, in order to strengthen collaborative relationships. Working together throughout the process of implementing the initiative was not obligatory, although being informed about the process and findings was expected by the practitioners and local residents, as a whole. More nuanced understanding of collaboration was realized where effective collaboration depended upon the type of research being undertaken.

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DEDICATION

To my parents, Lyudmyla Zbyranyk and Grygoriy Zbyranyk, for the endless love, support, and encouragement they have given me no matter how far I go.

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LIST OF ABBREVIATIONS

ACC	Assessment of Community Capacity
AEGP	Agri-Environmental Group Plan
AESB	Agri-Environmental Services Branch
BMP	Beneficial Management Practice
BR	Biosphere Reserve
EMAN	Ecological Monitoring and Assessment Network
MAB	The Man and the Biosphere Program
RAN	Representative Areas Network
RLBR	Redberry Lake Biosphere Reserve
RLW AEGP	Redberry Lake Watershed Agri-Environmental Group Plan
RM	Rural Municipality
UNESCO	United Nations Educational, Scientific, and Cultural Organization
WNBR	World Network of Biosphere Reserves
WWS	White-Winged Scoters

CHAPTER 1: INTRODUCTION

1.1. Statement of Problem

Biosphere reserves (BRs) are intended to serve as models of and learning sites for conservation and sustainable development (UNESCO, 2010). Initially the concept was formed in order to pursue research by scientists on the relationships between humans and nature (Francis, 2004). Since the inception of the BR concept in 1974 (UNESCO, 1996), community-based initiatives have been enhanced, and citizens engaged in collaborative processes, which have become strongly emphasized (Francis, 2004; Pollock, 2004; Ravindra, 2004). Consequently, the role of local people in environmental decision-making has been supported by the Seville Strategy and Madrid Action Plan, where community involvement is stated as an essential element of a BR (UNESCO, 1996; UNESCO, 2008). BR practitioners reside in the BR area and are part of the community. Therefore, to achieve the mandate of BRs, it is important that both researchers and practitioners collaborate effectively in order to achieve their mutual interests. The evident need for collaboration is supported by an increasing interest in and support for community-based research in the social sciences (e.g. Francis, 2004; Pollock, 2004; Ravindra, 2004), wherein researchers work with local people to define research questions or to help shape the outcomes of research. One such approach was taken in the Redberry Lake Biosphere Reserve (RLBR) by Sharmalene Mendis, in an effort to assess community capacity and produce results meaningful to residents of the region (Mendis, 2004). Nevertheless, there is no study on the collaborative relationship between researchers and BR practitioners, which could provide further recommendations of what can be done to improve and foster such collaboration. Studies around such collaboration could lead to more research performed on the site and could also facilitate knowledge exchange across the World Network of Biosphere Reserves (WNBR) (Schultz & Lundholm, 2010).

BRs provide a wonderful opportunity to study issues related to sustainable development and biodiversity conservation, as a means of delivering solutions and/or inspiration on how these can be achieved. Recent literature about natural resource management puts emphasis on resolving complex and controversial issues through decentralization; the engagement of stakeholders, with various background and expertise; through fostering adaptive capacity; and

through developing shared goals, trust, and transparency (Conley & Moote, 2003; Leong, Emmerson, & Byron, 2011; Rajaspera, Raik, & Ravololonanahary, 2011). This philosophy is particularly relevant in the context of BRs. Actors in such settings experience not only opportunities to see the diverse representation of stakeholders, but also witness challenges associated with it (Lockwood, Worboys, & Kothari, 2006; Wondolleck & Yaffee, 2000). Therefore, it is essential for researchers and practitioners to understand the prerequisites of the efficient collaborative management that in turn will benefit the BRs' sustainable development (Stoll-Kleemann & Welp, 2008). By "researchers", I am referring to the professionals, social and natural scientists and researchers alike, who represent academic institutions, government agencies, and/or NGOs. BR practitioners, on the other hand, are individuals who mostly reside in the BR area, including volunteers or paid employees, who are engaged in the planning and decision-making of the BR.¹

This study examines the collaboration between researchers and practitioners at the Redberry Lake Biosphere Reserve (RLBR), in Saskatchewan. The research addresses the following questions: What are the collaborative roles and responsibilities of the researchers and practitioners? What constraints impede this collaboration? What are the opportunities and challenges of collaboration? What kinds of research or practical initiatives are best suited to collaboration?

1.2. Research Objectives

The purpose of this study is to understand how researchers and BR practitioners can collaborate effectively in order to achieve BR objectives. In order to evaluate the collaborative process, this study looked at the range of projects which represent the functions of the BR.

To achieve the purpose of this study, the objectives are three-fold:

- To develop an operational definition of collaboration that effectively integrates the participation of researchers and BR practitioners;
- To learn the respective roles and responsibilities of researchers and BR practitioners in a collaborative process;
- To assess opportunities and challenges of collaboration between researchers and BR practitioners.

¹ Definitions of the researchers and BR practitioners are case specific and might not apply to other cases.

1.3. Thesis Overview

There are five chapters in this thesis. The thesis continues with the literature review in Chapter 2. A review is given of the BR concept, of collaborative management as well as collaborative experience in BRs, where opportunities and challenges are discussed. Chapter 3 focuses on describing the study area, the methodology used to collect data, and the techniques applied for data analysis in order to produce results. A short overview of all three initiatives is provided to explain different collaborative relationships assessed in further chapters.

The results of collaboration between researchers and BR practitioners are summarized in Chapter 4, with a particular attention paid to the factors of successful collaboration and their importance during the implementation of different projects. The roles and responsibilities of the researchers and practitioners are also observed under different circumstances. Finally, Chapter 4 points out the challenges and opportunities associated with collaborative process.

Discussion and conclusion are addressed in Chapter 5 along with the argument that collaboration for sustainable development, biodiversity conservation, and community-based projects or initiatives requires varied engagement from the participants. The thesis concludes with a summary of contributions it made, implications for further research, as well as the limitations of the research.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

BRs are areas with significant ecological, cultural, economic, or social values, which are designated by UNESCO in order to practice conservation of biological diversity, sustainable development, and logistical provisioning, to foster education, research, and the exchange of information. While in the early years, conservation was the primary purpose for studying BRs, since 1995, sustainable development has become an important function of BRs. Scientists have recently become interested in BRs, through studying environmental governance arrangements and sustainable development practices. The inception of the concept, its design and philosophy, expansion of the BRs' focus, importance of the researchers-practitioners collaboration in these unique geographical areas, and proposed mechanisms for collaboration are discussed in the following section (2.2).

In my research study, I refer to collaborative management (section 2.3). One of the distinguishing characteristics of this approach is its community participation that embraces local leaders, volunteers, groups of motivated individuals (Innes & Booher, 2003), experts (Renn, 2006), scientists (Schultz, Duit, & Folke, 2010), and other stakeholders involved in the decision-making process for sustainable development. The complexity of conservation and sustainable development issues calls for collaborative approaches in order to find solutions. At the same time, collaboration carries its own trade-offs (section 2.3.1). Such a variety of participants and interests creates both opportunities and challenges which are also faced when applied in BRs (section 2.4).

Much research has focused on collaboration among community stakeholders, with the purpose of extending the focus of BRs from a mere conservation function towards greater integration of conservation and development (UNESCO, 1996), although relatively little attention was paid to the collaboration of researchers and practitioners. Yet, that collaboration is important because of the interdependence of society with ecosystems, as well as because of the mutual interests of different stakeholders involved in the concept of a BR. The researcher-practitioner relationship is particularly important for the BRs, due to the organization's mandate, to support research and to act as "learning platforms," or "living laboratories," or "learning laboratories" (Nguyen, Bosch, & Maani, 2011; Schultz & Lundholm, 2010; Whitelaw, 2004). Therefore, in the past, research has always either been performed in the reserve or about the

reserve by external experts, whereas now the emphasis lies on collaboration between researchers and BR practitioners in designing and conducting research. By working together, BR practitioners can achieve the organization's functions and solve complex problems (Ravindra, 2004) because they can rely not only on local residents but also researchers. Scientists are the important component of both the conservation and sustainable development initiatives in the BRs (Schultz et al., 2010).

2.2. Biosphere Reserve Concept

Biosphere reserves are sites designated by UNESCO to promote and demonstrate the concept of sustainable development with the help of the local community and directed scientific research. The first BR was established in 1976 and now the World Network of Biosphere Reserves (WNBR) has listed 599 sites in 117 countries (UNESCO, 2012) as the sites for education and research, as well as for information sharing at regional, national, and international scales. From the very beginning, BRs were meant to be different from other types of protected area designations, such as national parks, nature reserves, sanctuaries etc., by their design and philosophy. Every BR uses an integrated zonation system and strives to improve conservation practices, to achieve sustainable use of natural resources, and to facilitate shared learning opportunities. There are three main zones on the site: the core, the buffer, and the transition or zone of cooperation. The core is the most protected and undisturbed area, where monitoring and biodiversity conservation take place; the buffer zone surrounds the core area and plays a role related to research and tourism; while the transition area is where local communities together with other stakeholders work towards maintaining and promoting sustainable resource management (UNESCO, 2010 b). Local and public participation in land and water management became essential and have been incorporated in the BRs' philosophy (Price, 1996).

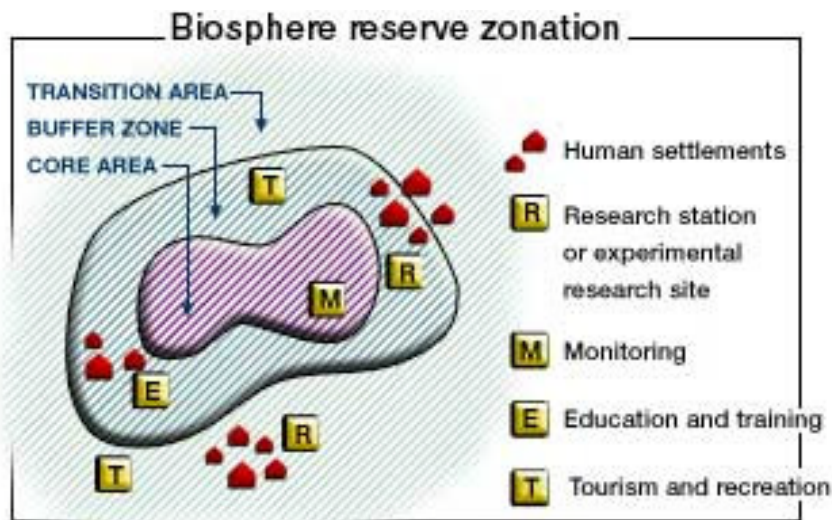


Figure 1: Biosphere reserve zonation UNESCO map (Nature Canada, 2012).

Evolution of the BR concept entails a change in human perception about the interdependence between humankind and environment. Originally, BRs were meant to serve as a benchmark against which changes could be measured and other ecosystems could be evaluated (UNESCO, 1973). The concept has continuously been evolving through the Man and the Biosphere (MAB) program, initiated in Paris, 1968.

The focus of the mandates of BRs has gradually shifted from mere conservation towards sustainable resource use and development (Stoll-Kleemann & Welp, 2008). At first, the Project 8 “Conservation of Natural Areas and the Genetic Material They Contain” (UNESCO, 1973), which is a UNESCO report through the MAB program, clearly emphasized the importance of conservation through BRs. The aggregation of information about the dynamics of the populations and communities was encouraged and used as a source of management decisions in the reserve areas. Later in the 1980s, practitioners grew concerned about environmental changes, and thus changed their approach towards the management of the BRs. The Scientific Advisory Panel of Biosphere Reserves expressed that “biosphere reserves should be demonstration sites of harmonious, long lasting relationships between man (*sic*) and the natural environment” (UNESCO, 1986, p.69). Therefore, it became essential to understand how conservation and development can be integrated through experts’ knowledge, skills, and attitudes. Although scientific involvement and collaboration with other agencies and organizations accelerated (Matysek, Stratford, & Kriwoken, 2006), there was no systemic evaluation of management performance and the real picture of the BRs’ performance has often differed from its concept. As

a result, two documents were produced at International Conferences on Biosphere Reserves – the Seville Strategy and the Statutory Framework of the WNBR – outlining the purpose and requirements of the BRs. Performance evaluation became possible with the help of periodic review, now required of a BR once every ten years (Price, Park, & Bouamrane, 2010).

The Seville Strategy (UNESCO, 1996) identified three functions which every single BR is determined to fulfill: conservation, development, and logistic support. A conservation function is intended to preserve landscapes, ecosystems, species, and natural resources; a development function focuses on sustainable economic and human development by taking into consideration social, cultural, and ecological issues; and logistic support is a function aimed to foster education, research, and information exchange, related to conservation and development of the BR (UNESCO, 1996). In order to implement these functions, key directions were identified. One of them was to strengthen scientific research, monitoring, training and education on the sites. Scientific knowledge was highlighted as an integral part of a BR's sustainable development. But at the same time little attention was paid to how collaboration between researchers and practitioners should be exercised in order to effectively fulfill the outlined functions.

The Seville Strategy defined implementation indicators, which are the recommendations for effective fulfillment of the above three functions, that ranged from the international to individual level. These indicators focused, among other indicators, on the following issues: identification of stakeholder interests; creation of the mechanisms to manage, coordinate, and integrate the reserves' programs and activities; establishment of the knowledge-sharing mechanism; and involvement of the local community in planning and managing the BR. At the international level, emphasis was placed on collaboration with other BRs, research and educational networks, and similarly-managed areas and organizations (Schultz & Lundholm, 2010). At the individual level, more organized and participatory planning of management activities was highlighted (Reed, 2009; Schultz et al., 2010; Stoll-Kleemann & Welp, 2008). These were only some of the initiatives laid out in the Seville Strategy and Framework of the WNBR (UNESCO, 1996).

Following the Seville Strategy and the Statutory Framework of the WNBR approved by UNESCO in 1995, a “+5 meeting” was held in Pamplona, Spain in 2000, where certain actions were determined, based on the recommendations from the Seville. The Madrid Action Plan was

further developed, based on the 3rd World Congress of Biosphere Reserves, held in Madrid in 2008. Once again, the Madrid Action Plan emphasized the importance of BRs as learning sites dedicated to sustainable development (UNESCO, 2008). Moreover, the Madrid Action Plan stated that mutual collaboration among researchers, practitioners, and other participants was a vital component of the BRs' process towards delivering principles of sustainable development and other BR objectives. The collaboration of researchers and practitioners, as a part of knowledge sharing process, was embedded in the vision and mission statements of the Madrid Action Plan. Thus, actions were proposed in order to strengthen collaborative relationships among the parties.

Enhancement of collaboration was proposed through various approaches. An approach, such as the creation and strengthening of the regional Thematic Networks as a means to bring outside experts and BR practitioners together to address key ecosystems (mountains, freshwater, forests, etc.), was one of them. Other important actions focused on the improvement of access to information and the adaptation of the knowledge for non-scientific groups. Strengthening the role of scientists in the decision-making process through a collaborative approach, combining different knowledge systems to strengthen scientific functions, and incorporating research into ecosystem management were also deemed advisable (UNESCO, 2008).

2.3. Collaborative Management of Protected Areas

Collaboration is “a kind of awkward dance that none of us know the steps to.” – Su Rolle (in Wondolleck & Yaffee, 2000: p. 64.)

BRs provide space for focused research, the implementation of sustainable development initiatives, and biodiversity conservation on the site. Studies focused around these functions require an approach to research that would meet expectations of local residents, practitioners, and researchers. The value of local knowledge and community participation in studies about and in BRs has been recognized and addressed in numerous papers (Edge & McAllister, 2009; Reed, 2009; Schultz et al., 2010; Stoll-Kleemann & Welp, 2008). Having termed this philosophy as diversely as community-based research, action research, or participatory research, this approach to research emphasized its central idea around the collaboration of a researcher with local people,

along the research study process. Taking this approach to research to the BR setting was important, as it served the purpose of exchanging information, knowledge, and expertise among local residents and researchers. At the same time, while local participation was studied and addressed in numerous papers, collaboration between researchers and BR practitioners has been overlooked (Matysek et al., 2006; Pfueller, 2008; Sayer & Campbell, 2004; Stoll-Kleemann & Welp, 2008). Due to the emphasis that the BR program has placed on establishing working relationships between BR practitioners and researchers as well as the potential for better fulfillment of the functions of BRs (Schultz et al., 2010), the issue of collaboration is important to study.

The “collaborative management” approach is a product of the evolution of human perception towards natural resource management and can be traced back to the key principles of bioregionalism (Aberley, 1999). There, emphasis is given to local participation, and shared power and responsibilities. Currently, collaborative management has been applied to different social-ecological settings, in order to solve complex conservation and development issues. Attempts to integrate local knowledge with the interests of stakeholders have resulted in the manifestation of various management approaches (Sayer & Campbell, 2004). Therefore, collaborative management can be recognized under integrated catchment management (UNESCO, 1993), integrated water resource management (Calder, 1999), community-based natural resource management, integrated rural development, integrated conservation and development programs (Franks & Blomley, 2004), ecosystem approaches (Secretariat of the Convention on Biological Diversity, 2001), landscape management, adaptive collaborative management, and multifunctional agriculture or forestry (Buck, Geisler, Schelhas, & Wollenberg, 2001). This work identifies key features required for the successful implementation of collaborative management (Table 1).

Overall, collaborative management is best described as the mutual learning (Stoll-Kleemann & Welp, 2008) of actors who hold various backgrounds, but share mutual interests and goals. These actors agree to continuously share knowledge and information (Lockwood et al., 2006), and are therefore better able to constructively reflect on and benefit from different perceptions, thus better enabling their abilities to find a solution to given problems (Gray, 1989). Collaborative management has particular characteristics which contribute to this approach’s success (see Table 1).

Table 1: Key characteristics of collaborative management

Characteristics	Source
Participation of multiple stakeholders	Pfueller, 2008; Conley & Moote, 2008
Integration of local and outside expert knowledge	Mendis-Millard & Reed, 2007; Pfueller, 2008
Sharing of information and knowledge, mutual learning	Stoll-Kleemann & Welp, 2008
Sharing benefits and costs	Lockwood et al., 2006
Sharing power and responsibilities	Berkes, 2004; Lauber & Decker, 2011; Redford & Sanderson, 2000;
Trust, respect, and mutual understanding	Wondolleck & Yaffee, 2000; Pfueller, 2008; Leong et al., 2011
Sufficient technical, human, and financial capital	Burbidge et al., 2011; Leong et al., 2011; Lockwood et al., 2006; Rajaspera et al., 2011; Wondolleck & Yaffee, 2000
Consideration of social, cultural, and economic goals	Burbidge et al., 2011
Process: flexible, adaptive, continuous	Wondolleck & Yaffee, 2000; Pfueller, 2008; Leong et al., 2011
Representation & commitment of the local community	Wondolleck & Yaffee, 2000; Pfueller, 2008; Leong et al., 2011
Tailored to the situation	Lauber & Decker, 2011; Lauber et al., 2011; Plummer & Hashimoto, 2011

Collaborative management involves the participation of landowners, interested citizens, scientists/researchers, public groups, environmentalists, experts, and other interested actors (Conley & Moote, 2003) in setting the goals, making or negotiating plans, engaging in various activities, and therefore sharing benefits and costs (Lockwood et al., 2006). The importance of multiple actors' participation in sustainable natural resource management is heightened with a growing realization of complexity and interdependence between ecosystems and society

(Chapin, Kofinas, & Folke, 2009; Schultz et al., 2010). Therefore, the overall focus lies on the integration of societies with their ecological environment, where both expert and local knowledge is required in order to recognize the issue and make sound decisions (Pfueller, 2008).

Collaborative management is seen as a process rather than an end product. This management approach to environmental governance has to consider a range of preconditions and specifics related to the actors involved and the process itself. Representation of the local community in the process is extremely important, as it appears to be a key mechanism for giving recognition to the local residents' rights. In order to foster growth and development, it is imperative that an organization obtains both an initial commitment from the local residents and the trust of interested stakeholders, prior to working together (Leach & Pelkey, 2001; Leong et al., 2011; Pfueller, 2008; Wondolleck & Yaffee, 2000). Local people and outside experts may experience technical challenges during the planning process, when confronted with highly complex issues and nomenclature. Therefore, determining who represents the local community and to what extent local people should be involved have to be carefully considered in order to have successful communication and information-sharing processes. It can also be challenging due to the varied inclusiveness of the process, where stakeholders' attitudes and perceptions might differ, but still have to be understood and taken into consideration, so that decisions about research and management can be made (Lockwood et al., 2006; Mascarenhas & Scarce, 2004).

Collaboration between multiple stakeholders assumes aggregation of knowledge and experiences, which leads to different roles and responsibilities of the participants. Negative past experiences may lead to negative assumptions about future collaborations that can create skepticism between communities and resource managers. It may create divisions between them, even though they tend to share the same interests. The obverse is also true; positive experiences may encourage future collaborations. As a result, when stakeholders approach a complex problem from different perspectives, both challenges and opportunities arise. Therefore, it is extremely important to have trust, respect, and mutual understanding among each group in order to build capacity and to be able to adapt and progress. It is also vital to have sufficient technical, human, and financial capital for successful implementation of collaborative management (Burbidge et al., 2011; Krishna, Chhetri, & Singh, 2002; Mendis 2004; Leong et al., 2011; Lockwood et al., 2006; Negi & Nautiyal, 2003; Rajaspera et al., 2011; Wondolleck & Yaffee, 2000).

2.3.1. Collaborative conservation.

Rapid changes in the social-ecological systems, where species' population dynamics, landscapes, and human activities are constantly being altered, make it difficult for the flora and fauna, and also for people and institutions, to effectively respond to these changes. Such complexities create a challenging environment for the conservation practice to be successful, long-lasting, and capable of predicting its effect on other characteristics of the system. Therefore, conservation requires an approach that will enable a mixture of responses to changing conservation needs. A collaborative management approach tends to meet this requirement because of the diverse expertise drawn to solve the posing issue. Researchers and practitioners referred to collaborative management approach in order to resolve complex environmental issues and consequently started to frame it under the term “collaborative conservation” (Lauber & Decker, 2011; Lauber et al., 2011; Ghimire & Pimbert, 1997).

Collaborative conservation is a subset of collaborative management, wherein most of the characteristics are shared but differences are also present. Both approaches have multiple stakeholders, hence related opportunities and challenges. The important characteristic of collaborative conservation is the quality of engagement, if one is focused on the process of collaboration itself. Collaboration among stakeholders during the project's implementation process can be eliminated if the project is not big enough for the time and effort that collaboration takes (Snow, 2001).

Collaborative conservation initiatives have gained popularity in recent years. They involve integration of diverse components such as knowledge, resources, networks, capabilities, and political power, as a result of the various actors' engagement. This approach aims to go beyond the conventional way of conserving ecosystem attributes and processes, and additionally takes into consideration social, cultural, and economic goals. These additional goals make conservation more holistic and sustainability-oriented (Berkes, 2004; Burbidge et al., 2011).

Throughout literature, this environmental governance model has also been termed community-based conservation (Berkes, 2004), community-based natural resource management (Child & Barnes, 2010), ecosystem management (Meffe, Nielsen, Knight, & Schenborn, 2002). Although participation and inclusion of diverse stakeholders remain a general philosophy, the dynamics of the process itself change, depending on the stage, context, and complexity of the conservation initiative. There is no one ultimate approach for all cases. The structure of the

collaborative relationships changes, due to various social and ecological factors, and can be adapted according to the requirements of the initiative. For example, situations wherein leadership and expert knowledge are most required, a few key players will take the lead (referred as ‘high centrality’ by Lauber et al., 2011). Collaboration then takes the form of an information exchange process. At the same time, such approach and respective responsibilities can be altered intentionally, as a situation requires (Lauber & Decker, 2011; Lauber et al., 2011; Plummer & Hashimoto, 2011).

Despite many successful examples of collaborative conservation initiatives, there are a number of stumbling blocks that must be considered. Conservation initiatives greatly vary in the complexity of their structure and sometimes participants can be challenged to find a way to adopt a collaborative approach. Therefore, successful collaborative partnerships have to modify the process, according to the demands of the situation. If collaborative conservation practice works in one setting, it does not necessarily work, once transferred to a different setting. Environment, culture, values, and other social specifics also have to be understood and considered. Another view is that conservation and development might need to be addressed separately, because the holistic approach of collaborative conservation can create conflict between these two objectives (Redford & Sanderson, 2000). It is also important to consider managerial characteristics, such as sharing power and responsibility, which in turn create the environment for learning, sharing, and trust- building (Berkes, 2004; Lauber & Decker, 2011; Redford & Sanderson, 2000; Plummer & Hashimoto, 2011).

Although collaborative conservation might be challenging and difficult to implement, opportunities become realized and utilized, once the collaborative relationships mature and stabilize. A collaborative conservation approach should be tailored to each particular setting. Initially, it requires good organizational skills, well-structured meetings, appropriate relationships between individuals and institutions, a sense of place, continuous learning, and adaptation to name just a few factors. Overall, the collaborative conservation model necessitates holistic ways of looking and relating to nature and society, in order to create an indisputable collaborative setting (Berkes, 2004; Crona & Bodin, 2006; Lauber et al., 2011; Wondolleck & Yaffee, 2000).

2.4. Collaboration Experience in Biosphere Reserves

Biosphere reserves continually strive to fulfill sustainable development, biodiversity conservation, and logistic support functions. Additionally, the operational success of BRs is determined by the appropriateness of the management approach and the degree of community participation (Stoll-Kleemann et al., 2006). Therefore, it is beneficial to bring scientific as well as local knowledge together to assist in fulfilling the functions of the BR. Interestingly enough, recent involvement of social scientists and interdisciplinary research teams has encouraged and sometimes facilitated local participation (Reed, 2009). Stoll-Kleeman and Welp (2008) highlighted three of the most important reasons why BRs tend to emphasize participation as an integral part of BRs' development. *First*, there is a necessity to develop mutual decision-making including local leaders, volunteers, groups of motivated individuals, landowners, etc. to give them an opportunity to be part of the processes that affect their lives (Innes & Booher, 2003). The *second* is effectiveness, meaning that decisions and management practices are most likely to be exercised and accepted, if the majority of the affected players support them (Renn, Webler, & Wiedemann, 1995). And the *third* reason is related to the involvement of experts from various fields (here referred as researchers), in order to assist with complex issues and technical information (Pfueller, 2008) that is faced during the management process (Renn, 2006).

Engagement of individuals in community interactions extends the boundaries for thinking, decision-making, innovations, and the creation of solutions (McCarthy, Whitelaw, Jongerden, & Craig, 2006). Participation and collaboration of stakeholders tend to increase efficiency and accuracy in decision-making, and strengthen efforts in management activities and conservation practices (Lal, Lim-Applegate, & Scoccimarro, 2001; Schultz et al., 2010). Interestingly enough, scientists were recognized to have a positive effect on conservation results directed by the community and also had an increased support from the actors involved in management activities. At the same time, local residents seemed to have a strong effect on implementation of decisions and a weaker effect on the decision-making process itself (Schultz et al., 2010).

In order to assist participatory processes at BRs, different skills and methods have to be applied. Social or collective learning is one way to incorporate participation, where "social learning means more than merely individuals learning in a social situation ... (they) envision a community of people with diverse personal interests, but also common interests, who must come

together to reach agreement on collective action to solve a mutual problem” (Webler, Kastenholz, & Renn, 1995). At the same time, people can be overwhelmed with new information, which in turn can lead to disorganization. Therefore, it is also important to take into consideration the way information is presented; events, conferences and forums should be planned and well prepared (Ravindra, 2004). Ignoring community participation in decision-making processes for conservation will likely fail in the long-term. Lockwood et al. (2006) note that public communication and collaboration are major factors for achieving conservation results.

Exchange of knowledge and information among stakeholders is a key element of successful management of natural resources. Social networking is an effective tool for distributing Local Ecological Knowledge (LEK) and therefore fostering sustainable management (Crona & Bodin, 2006). Various publications stress not only the importance of ecosystem managers and local stewards’ continuous learning about different management practices, but also how bridging organizations and networks can facilitate or hinder such learning (e. g., Schultz & Lundholm, 2010).

The WNBR “represents a unique tool for international co-operation through sharing knowledge, exchanging experiences, building capacity, and promoting best practices” (UNESCO, 2010). Schultz and Lundholm’s (2010) study on learning opportunities in BRs showed that various learning activities such as workshops, forums, meetings with the managers of other protected areas in a region, act as a platform for dialogue between people, different knowledge systems, and decision-makers. Stoll-Kleemann and Welp (2008) formulate such mutual learning as “the ideal condition for communication” that leads to “more transparent, accountable, and legitimate” planning process.

BRs also embody some of the challenges of collaborative management mentioned earlier. Stoll-Kleemann and Welp (2008) point out several challenges revealed from their international survey of BRs. Lack of time and financial means often become barriers to the participatory process. Regional or local managers also exhibited an unwillingness to share power. In some countries, the rights of disadvantaged groups, such as women or ethnic minorities, may clash with local customs. The authors also emphasize the importance of expert knowledge and guidance in the process of participation in order to have clear objectives and keep the right direction, otherwise collaboration may result in chaotic meetings and the loss of direction.

A collaborative process adapts when new ideas are taken into consideration and is flexible in its approach to fulfilling objectives (Wondolleck & Yaffee, 2000). Researchers find the process challenging, as they have to be constantly aware of all the parties involved (assistants, community members, and funding agencies) before making adjustments. As a result, more time is required to fulfill the expectations of the collaborative research. The difference in power between researchers and practitioners is another challenge faced in the process of collaboration. Both sides might resist conceding, thus weakening a collaborative process (Reed, 2009). Sometimes researchers and practitioners have different priorities due to their societal standing, different outlooks, and some other circumstances involved which make it difficult to find a middle ground and set further direction. Consideration of the each side's position and lifestyle makes collaboration more effective as the availability of time and use of different "language" can become a big challenge towards reaching BR objectives. Thus, different types of information have to be integrated and different "reward" structures introduced.

Table 2: Factors of effective collaboration

Factors of effective collaboration	Source
Setting clear goals for the project together	Lockwood et al., 2006
Planning the project together	Wondolleck & Yaffee, 2000
Adequate finances	Burbidge et al., 2011; Lockwood et al., 2006; Rajaspara et al., 2011; Wondolleck & Yaffee, 2000
Trust	Wondolleck & Yaffee, 2000; Pfueller, 2008; Leong et al., 2011
Communication and information exchange	Stoll-Kleemann & Welp, 2008; Wondolleck & Yaffee, 2000
Performing research tasks together	Wondolleck & Yaffee, 2000
Monitoring together	Ervin, 2003
Evaluating results together	Ervin, 2003
Making decisions together	Lockwood et al., 2006; Wondolleck & Yaffee, 2000; Innes & Booher, 2003
Gained knowledge and understanding	Frame et al., 2004; Conley & Moote, 2003
New and improved relationships	Frame et al., 2004; Conley & Moote, 2003

Therefore, my research study will be directed at learning how researchers and BR practitioners can collaborate effectively, based on a case study of Redberry Lake BR in Saskatchewan. Evaluation of the established factors of collaboration (Table 2) will help to understand how and why collaboration between researchers and practitioners varies under different circumstances, as well as what opportunities and challenges have to be faced in a researcher-practitioner relationship.

Factors of effective collaboration identified in academic research that can be applied to a BR are summarized below. In this thesis, these factors will further be evaluated by the participants in research studies that have been focused on each of the three functions of the BR.

CHAPTER 3: STUDY AREA AND METHODOLOGY

3.1. Introduction

The case study used in this research study is Redberry Lake Biosphere Reserve, located in Saskatchewan, Canada. This particular site was chosen for the research study for several reasons. Firstly, Redberry Lake has been functioning as a BR for a decade and has a track record of associated successes and challenges. RLBR's periodic review assisted in identification of both successes and challenges. Secondly, although various research has been conducted in the BR and about the BR, no studies have examined how researchers and practitioners have worked together under one project or initiative. And last, but definitely not least, its location is convenient and does not require long distance travel.

3.2. Study Area

Redberry Lake is one of the 16 UNESCO-designated BRs in Canada. This site received its designation on January 21, 2000, thus became part of the WNBR, and became first and the only BR in the province of Saskatchewan. It is located in the south-western quarter of the province, approximately 80 km northwest of Saskatoon (Figure 2). The territory of the RLBR includes complete and partial portions of several Rural Municipalities (RMs). RM of Redberry (RM435) takes up most of the RLBR region and is home to 451 people (Statistics Canada 2006), while Meeting Lake (RM 466), Great Bend (RM405), and Douglas RMs (RM436) occupy much smaller areas (Sian, April 2002). Most of the RLBR's population lives in the town of Hafford in Redberry RM. It counted for 360 people with -10.2% in population change from 2001 to 2006 (Government of Saskatchewan, 2010). Such rural depopulation was mainly caused by the agricultural evolution, when farms became fewer and larger. The 2011 census showed that the population of Hafford has increased to 397 people (Government of Saskatchewan, 2012). This trend was explained by the availability of cheaper housing in comparison to the cities, which encouraged people to come to Hafford (local citizen, BR practitioner). Local citizens are primarily of Ukrainian origin and still hold onto their traditions and customs, that are evident in the town's many cultural and historical characteristics, particularly that the names of the streets are written in both English and Ukrainian.

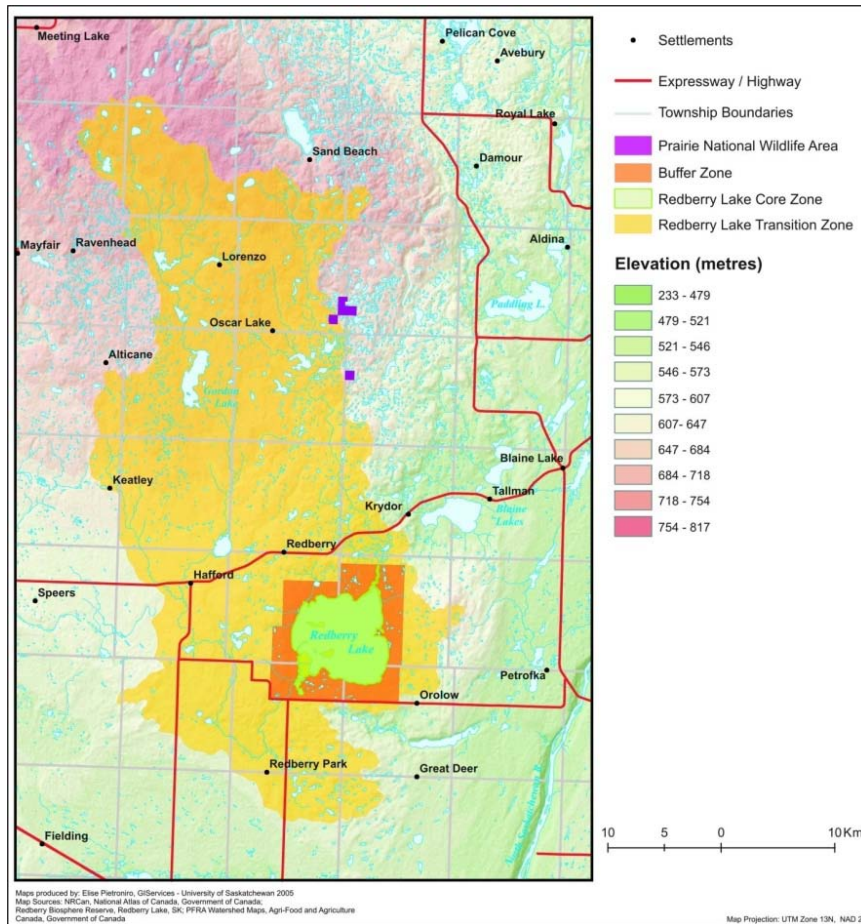


Figure 2: Redberry Lake Biosphere Reserve zonation map (produced by Elise Pietroniro, GIServices – University of Saskatchewan 2005).

The RLBR embodies the Redberry Lake watershed with an ecologically significant saline lake and several islands in the centre. It covers 112 200 hectares in total and divides into three zones, each one of which represents its own function. The lake forms the legislatively-protected core area of 5 600 hectares. The lake with islands is also designated as a Federal Migratory Bird Sanctuary. Redberry Lake hosts over 180 bird species, among which are one of the largest colonies of American White Pelicans (*Pelecanus erythrorhynchos*), and the greatest breeding concentration of White-Winged Scoters (*Melanitta fusca*) in North America (Alisauskas, Kehoe, Traylor, Kellett, & Swoboda, 2010). Moreover, the lake is located on the migratory route of the Whooping Crane (*Grus americana*), one of the rarest birds in North America. Decreased water levels compromise the full ecological functioning of the lake causing enhanced predation and loss of biodiversity. Redberry Lake is also surrounded by prairie and aspen parkland. There are

small patches of natural mixed prairie which is very rare in this highly grazed and cultivated part of the prairies. Surrounding the core area is the buffer zone of 6 300 ha that includes both private and Crown lands. This area takes up the lake shoreline, the uplands of the watershed, and is also located within the Regional Park. Together the core and buffer zones are part of the Federal Ecological Monitoring and Assessment Network (EMAN) and the Provincial Representative Areas Network (RAN). The transition zone or area of cooperation occupies the rest of the Redberry Lake watershed of 100 300 ha. The land is either Crown or privately-owned. The core, buffer, and transition zones occupy respectively 5%, 5.6%, and 89.4% of the total area that integrates objectives related to conservation and development on the site. (Bowman & Sachs, 2008; Mendis, 2004; Sian, April 2002; UNESCO, 2010a).

The main economic activities on the site are agriculture and the raising of livestock. Sustainable development, biodiversity conservation, and education are not only the functions of the RLBR but also the principles that BR practitioners and local people are/have been trying to live by. A few farms in the BR area follow specific regulations in order to raise organic produce. But such practices are becoming more challenging, due to the pricing on the market that forces farmers to go back to a conventional approach. Nevertheless, BR practitioners have been seeking opportunities to implement initiatives that help to create, support, and/or maintain ecological goods and services within the RLBR. Research, conservation measures, and sustainable practices are/have been carried out in collaboration with organizations such as Environment Canada, Ducks Unlimited, Saskatchewan Watershed Authority, the Provincial Council of Agriculture Development and Diversification (ADD) Boards for Saskatchewan Inc. (PCAB), the National Hydrology Research Institute, and the University of Saskatchewan.

The region's willingness to promote *sustainable* development and to secure the concept of the BR is reflected in their vision:

We who reside within the Redberry Lake Biosphere Reserve live and work together in a healthy landscape under a common banner of equality, dignity, and respect. Democratic processes are fundamental to our community decision-making at every level, and community and economic growth are managed in an orderly and considered fashion that can be seen by others as

an ideal for human community living and sustainable environmental practice (RLBR, 2012).

Having existed for more than a decade, the RLBR has achieved some successes by advancing a range of initiatives. The periodic review report (2011) summarizes the accomplishments and struggles of the BR. It appears that stability of the organization's functioning has been compromised by the lack of a core funding and therefore creates some barriers at the RLBR's operational level. The report suggested that there are insufficient number of staff working on day-to-day activities, such as outreach, fundraising, and networking. The ability to initiate projects and/or events in order to meet the goals of the organization has been limited. According to the report, in recent years, governmental cutbacks have also played a role in decreased monitoring capacity of the lake and bird species. Nevertheless, local willingness to engage and communicate with external agencies helped to make the projects happen, thereby contributing to the sustainable development of the region (Whitelaw & Schmutz, 2011).

3.3. Research Methods

This study used a qualitative research approach to evaluate collaboration between researchers and BR practitioners in specific projects undertaken in the RLBR region. Documents and interviews were the primary sources of data necessary for the analysis. Document analysis provided general information on the projects undertaken in the BR, and a literature review assisted me in getting accustomed with the theory of collaborative management, and its opportunities and challenges. Interviews and documents helped to answer my research questions and achieve the objectives of my study.

3.3.1. Projects overview.

The projects were selected, based on these criteria:

- involved both BR practitioners and researchers;
- represented all the functions of a BR: sustainable development, biodiversity conservation, and logistic;
- required some degree of collaboration;
- were initiated in different years;
- had demonstrated outcomes;

- represented both natural and social sciences;

As a result, three projects out of 50 that had taken place in the Redberry Lake region were selected: the Redberry Lake Watershed Agri-Environmental Group Plan (RLW AEGP), Studies on White-Winged Scoters (WWS), and the Assessment of Community Capacity (ACC). RLW AEGP was initiated by Saskatchewan Watershed Authority and Ducks Unlimited in 2006 and is still ongoing; studies on White-Winged Scoters by Environment Canada have been present since the BR's designation in 2000; and Assessment of Community Capacity was an academic (University of Saskatchewan) research study that took place in the summer of 2003-04. Each initiative represented at least one of the functions of the BR. The RLW AEGP addressed sustainable development function; studies on WWS focused on biodiversity conservation; and the ACC dealt with the logistic/education function. Having interviewed and reviewed related documents and reports, I found that there were different levels of collaboration between researchers and BR practitioners, during the projects' implementation process. A brief overview of each project is introduced to the reader below.

The RLW AEGP (Figure 3) is an initiative that focuses on the surface and ground water quality. It helps landowners to adopt beneficial management practices, in order to reduce the impacts of agriculture on water quality through improved livestock site management, improved manure management, improved land management, water well management, and improved pest management (Hawrysh, 2011).

The Redberry Lake Watershed is one of the regions where the AEGP concentrates its work. It is an excellent arena for the implementation of beneficial management practices and blends with the concept of the BR very well. This initiative has so far attained a great number of goals focused around water, air, soil, and biodiversity protection, by implementing various projects such as fencing (273 projects), portable windbreaks (83 projects), portable calf shelters (44 projects), grass seeding (40 projects), alternative water systems (56 projects), creek crossing (5 projects), predator fencing (3 projects), buffer (5 projects), and well decommissioning (8 projects) (Kindrachuk, 2011).

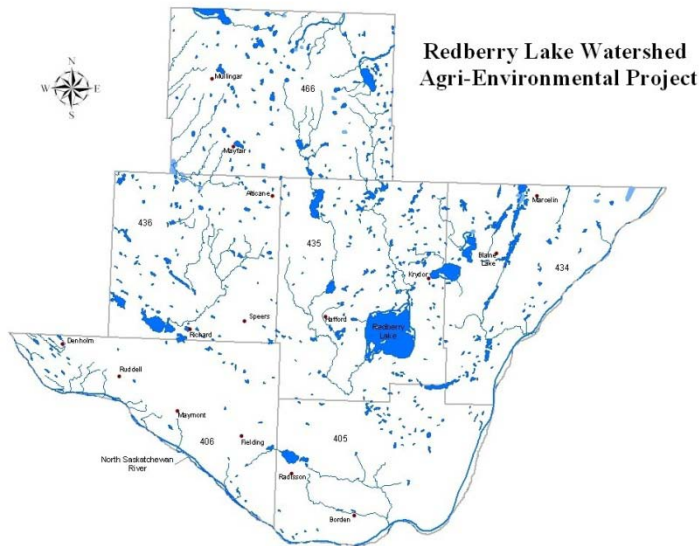


Figure 3: Six Rural Municipalities in the Redberry Lake Watershed (RLW AEGP proposal, 2011)

The purpose of the studies on WWS (*Melanitta fusca*) was to understand the breeding biology and population trajectory of this bird species, as its population has been declining over the last 30 years. This species of Scoters appears to be the only one to breed in the prairies of Western Canada. Over the last 20 years, breeding pairs have declined by about 45% in the aspen parkland of the BR, while this species has already disappeared on Jessie Lake in Alberta. There is a high chance that Scoters will soon be extinct in the Parkland ecoregion of Western Canada, if these declines persist. If Scoters disappear from the watershed, they would be at most locally extinct. Studies have taken place at Redberry Lake since 2000, and generated the results of the number of nests at the lake (Figure 4). These studies provided an opportunity to compare findings throughout the years, as well as to use the findings to aid in the management of predation-control on the lake (Alisauskas et al., 2010).

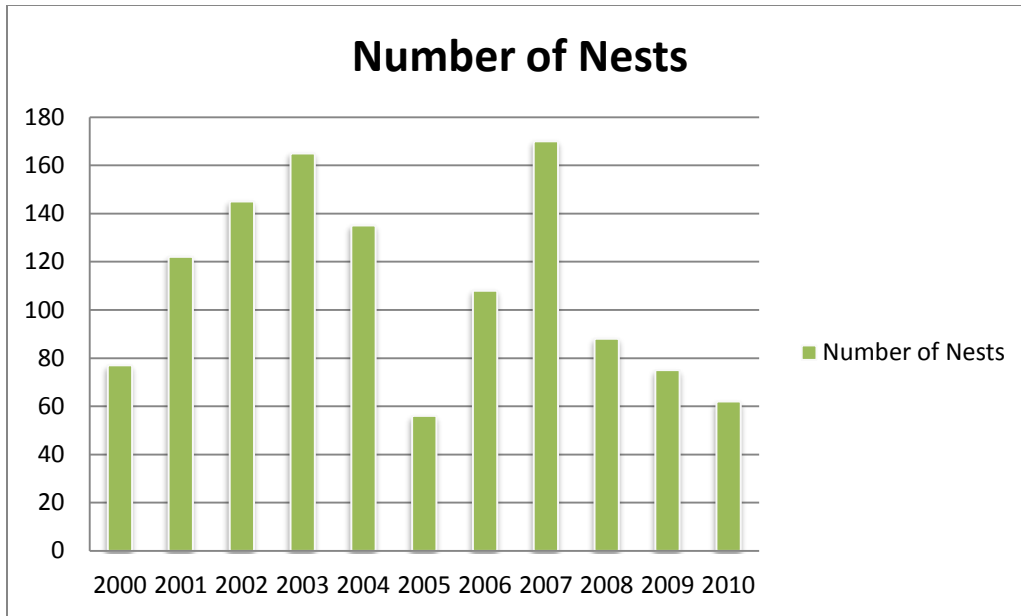


Figure 4: Number of white-winged scoter nests found at Redberry Lake, Saskatchewan, 2000-2010 (Alisauskas et al., 2010).

The study around the ACC at the RLBR focused on the understanding of what community capacity was within a region using an ecosystem-based management approach. Initiated by a researcher at the University of Saskatchewan, a community-based research approach provided an opportunity for the BR to bring awareness and greater understanding of the BR concept to the community, through meetings, focus groups, activities in the school, community events, and casual conversations. This community-based approach to research brought people together and acted as an eye-opener for many in the region. This study was also a tool to identify the strengths and weaknesses of the organization and what could be improved in the region; it encouraged local community members to be part of the activities that took place during and after the study. For some, this study was the first encounter of local people with an academic researcher and it opened the door to other Social Science researchers. At the same time, the RLBR had a chance to fulfill its function in logistical provisioning that was responsible for the education, research, monitoring, and information exchange (Mendis, 2004).

3.3.2. Data collection.

3.3.2.1. Interviews.

The majority of data was gathered through 12 semi-structured interviews. The interviews were open-ended and closed, and were done face-to-face or over the telephone. Open questions allow the interviewee to reflect more freely and provide the depth of knowledge and expertise on one hand and to explain their uncertainty on the other. These questions help to create a more natural flow of conversation and to facilitate unexpected directions, leading to a new knowledge and to key informants. Closed questions have a narrower focus, and thus the kind and amount of information are predetermined and easier for the interviewer to control. They aim to generate quantifiable data (Stewart & Cash, 2008).

I conducted 12 semi-structured interviews with researchers and BR practitioners. Interviewees were selected, based on their engagement with the projects that were selected for this study. Six people represented the RLBR as BR practitioners, and the other 6 were research employees of governmental agencies, environmental non-governmental organizations, and academia. At the same time, two BR practitioners were able to reflect on more than one project. The RLBR Board, Environment Canada, Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the University of Saskatchewan were all represented by the participants.

At first, a brief description of the study was sent to the participants, asking about their interest in participating in the study. Once participants agreed to be involved, interview questions and a consent form outlining the purpose and procedure of the study, potential risk and benefits, confidentiality and rights to withdraw, were sent out. Consequently, there were in total seven face-to-face interviews held in the Redberry Lake region and at Environment Canada in Saskatoon; and five phone interviews with participants from the University of Waterloo, the Saskatchewan Watershed Authority office (North Battleford), and a BR representative from Hafford.

For the BR practitioners, the questions were formulated in a way to address personal involvement in the RLBR; mission/goals, objectives and strategies of the organization; regional issues and project priorities; collaboration with other partners and what role different factors played in implementation of the project(s), the importance and effectiveness of the factors of collaboration; activities of the BR as an organization; governance structure of RLBR; and

inclusion of the social groups in the operations of the BR. By contrast researchers were asked only questions developed from the literature review, that pertained to collaboration, such as how they defined it, what were the key elements and lessons that were taken away, as well as what was the importance and effectiveness of the factors of collaboration. As a result of the participants' input, a few adjustments to the factors of collaboration were made, and an additional factor was acknowledged. Interviews were audio- recorded, transcribed, and coded using NVivo 9.2 qualitative data analysis software.

In accordance with the ethical guidelines, the names of the interviewees are not included in this thesis. Instead, interviewees are categorized by their relation to the BR, either as a BR practitioner or as a researcher with an assigned number.

3.3.2.2. Document Analysis.

Document analysis is a method that uses written documents as primary sources of data. This method employs different forms of text: a) objective authoritative sources, such as journal articles, books, surveys and official reports; b) historical documents, such as an organization's records and policy documents; c) communication documents, such as e-mails, and memoirs; and d) multimedia sources, such as newspaper or magazine columns or articles, and news reports. (O'Leary, 2004). Document analysis in this research study was done prior to and after interviews. Since the beginning, journal articles, grey literature, UNESCO-MAB reports, and related websites provided the background of the BR concept and its evolution, as well as information on collaborative management and its opportunities and challenges (Francis, 2004; Stoll-Kleemann, De La Vega-Leinert, & Schultz, 2010; UNESCO, 1996; 2008; 2010a; 2010b; 2012). The Seville Strategy (1996) and Madrid Action Plan (2008-2013) thoroughly covered the agenda of the WNBR, while journal articles provided an overview of the BRs' current trends, approaches, findings, and struggles (Dempster, 2004; Edge & McAllister, 2009; Price et al., 2010; Stoll-Kleemann & Welp, 2008).

More localized information on the RLBR was collected through the periodic review document (Whitelaw & Schmutz, 2011) and first-hand communications with an executive director and board members of the organization. Several meetings with the executive director of the BR produced information on the projects undertaken in the Redberry Lake region during the last decade, helped to identify three projects according to the criteria for selection, and identified the key informants. The documents/reports related to the RLW AEGP (Hawrysh, 2011) and the

report on WWS (Alisauskas et al., 2010) provided a general overview of the projects, their goals, objectives, and results. A thesis (Mendis, 2004) and an article (Mendis-Millard & Reed, 2007) produced out of the ACC initiative were also helpful in order to understand the goal, objectives, and process of its implementation. Information obtained and further interviews resulted in triangulation. Triangulation was used in order to confirm the authenticity and accuracy of the conclusions drawn (Conley & Moote, 2003).

3.4. Data Analysis

Data analysis was performed in several steps. In order to analyze data produced from interviews and literature review, the software program NVivo 9 was used. It is a qualitative data analysis program that assists researchers in dealing with large quantities of information, by sorting and aggregating data into a single file from different sources. It hence helps to unravel the general feeling about an issue. Once I audio recorded interviews, I transcribed them in NVivo 9 and saved them as Word documents. The next step was coding, used to sort data. At first, a preliminary coding system was developed based on the emergent themes in the research. Codes were then ascribed to text. Some sections of text were multi-coded, when the message it carried referred to different themes (see Appendix A). Subsequently, I developed themes and sub-themes and, where it made sense, I amalgamated some sections of text. As parts of text could be reread as a single file, a diversity of opinions could be seen under each theme and a pattern could be identified. Finally, I undertook interpretation and synthesis to produce the final findings. I had an opportunity to present my results at a seminar, which was attended by some of the BR practitioners.

CHAPTER 4: RESULTS

4.1. Introduction

This chapter reveals that key factors of collaboration identified in the literature are also important for practitioners and researchers. It also reveals that additional factors are also considered important to those involved in collaboration. Furthermore, the findings suggest a more nuanced understanding of collaboration, suggesting that the type of research being conducted will influence the expected engagement and responsibilities of researchers and practitioners.

The findings that relate to the operational definition (objective 1), roles and responsibilities of the researchers and BR practitioners (objective 2), and opportunities and challenges of collaboration (objective 3) are presented in this chapter. In order to rationalize the results found around the objectives, the issues around the RLBR's functioning are presented. These issues are organized under economic, ecological, social/demographic, and governance/operational categories (section 4.2). Further, section 4.3 explains why collaboration is an essential part of the BR's effective functioning, introduces an operational definition of collaboration, and draws attention to the factors of collaboration which made the WWS, AEGP, and ACC initiatives successful. Key lessons and outcomes learned by the researchers and BR practitioners complement the findings (section 4.4). Based on the interviews, the results related to the factors of collaboration are presented in section 4.5 and opportunities and challenges of collaboration are identified in section 4.6.

4.2. Reality Check: Pressing Issues of the RLBR

There are several pressing issues faced by BR practitioners and local residents. These issues hinder the ability of practitioners and researchers to collaborate as well as to live up to the goals of the BR. This research revealed the importance of understanding this kind of context prior to learning about collaboration. One can better understand the collaborative relationship between researchers and practitioners, by realizing the issues that affect stakeholders' functionality.

4.2.1. Economic issues.

Most of the RLBR's population lives in the town of Hafford in Redberry RM. According to Saskatchewan 2006 and 2011 population censuses, Hafford accounted for 360 persons in 2006 and 397 persons in 2011 (Government of Saskatchewan, 2011). Local residents' earnings and income are much lower than in Saskatoon or Saskatchewan as a whole (Table 3). A similar situation is observed across all RMs within the RLBR.

Table 3: Earnings and income census data (retrieved from City-Data.com).

Earnings & Income², 2006

	Hafford	Redberry RM #435	Meeting Lake RM #466	Great Bend RM #405	Douglas RM #436	Saskatoon	Saskatchewan
Median	CAD	CAD	CAD	CAD	CAD	CAD	CAD
earnings	15 899	10 591	10 047	14 469	9 380	25 485	23 025
Average	CAD	CAD	CAD	CAD	CAD	CAD	CAD
	19 407	14 612	14 612	14 612	14 612	26 345	25 788
Median	CAD	CAD	CAD	CAD	CAD	CAD	CAD
income	14 070	14 953	14 394	17 210	14 848	25 868	23 755

The local economy of the site largely depends on the success of the local farmers' productivity, either producing crops or raising livestock. Along the course of changes in global agricultural trends, farmers have had to adjust to the demands of the market and increase the size of farming operations (Whitelaw & Schmutz, 2011). Several farmers have been growing organic produce and raising grass-fed livestock. This practice has not only represented some of the principles of sustainable development, but has also been targeted for the future, to become a labeling and marketing initiative of the Redberry Lake BR's produce. However, the price of organic produce has decreased on the market and has been pushing farmers to return to conventional farming. This concerns BR practitioners because conventional farming is hard on the soil and also eliminates biodiversity (BR practitioner #1).

² Persons 15 years and over (City-Data.com)

The effectiveness of the RLBR's functioning greatly depends on how much funding is available to support the BR's operations. Unfortunately, provincial financial support for the BR ended in 2010 (Whitelaw & Schmutz, 2011) and it became difficult for the BR to keep up with the cost of organizational operations. The Education and Outreach centre at the BR lacks staff, in order to be efficient, enhance networking, and build community capacity. A BR practitioner pointed out that "a big thing is having more staff and not one person trying to do everything, from budgeting, to administration, to all the goings on. It's very hard to be efficient in all of them. So you can spend more time doing one thing and not enough that another part of it and [that] other part suffers. ... Sometimes some things get left at last and then you are struggling or rushing to get those things done in time" (BR practitioner #3).

4.2.2. Ecological issues.

The biodiversity conservation function of the RLBR has been carried out with a help of researchers from governmental agencies, NGOs, and academia. From the BR practitioners' observation, there is a noticeable decline in the lake's biodiversity for the last decade. Findings of the studies on the population trajectory of White-Winged Scoters also demonstrated the decline (Alisauskas et al., 2010). Also, the BR practitioners pointed out that coyotes populated the region and possibly became the reason for the pelicans' disappearance in summer 2011 (BR practitioners #3, 2, 5). BR practitioner noted that "people see trends, fewer species out there, different birds, they will see an increase of the number of predators, getting around like coyotes and wolves, why is that?" (BR practitioner #5). Yet, research studies on the lake, monitoring of the bird species, and water-level studies either declined or stopped, due to governmental cutbacks (Whitelaw & Schmutz, 2011). All in all, biodiversity research gaps still have to be defined, in order to identify the priorities of the organization in relation to the biodiversity conservation function.

4.2.3. Social/Demographic issues.

Although the RLBR has been functioning since 2000, the concept of a BR, its mandate, and functions are still foreign to the local residents (BR practitioners #1, 5). Local residents still need to become familiar with practices that strengthen sustainable development of the region in order to strengthen the community capacity of the RLBR. One of the practitioners noted that "the

lack of education that they [local residents] have in regard to things that the BR stands for. ... if we can get that information out in a way that is acceptable to them [local residents], then we can have bigger, larger impact” (BR practitioner #5). There is a lack of initiatives which would encourage local people to engage, express their concerns and ideas, as well as learn about the overall development of the RLBR (BR practitioner #5). These comments suggest that practitioners believe that there is still work to be done to make the local community aware about the mandate of the BR.

The local population in the RLBR was declining up to 2006, caused mainly by migration of youth to bigger cities (personal communication, 2011). This demographic situation made it challenging to pass local knowledge to a new generation: as one practitioner emphasized, “the brightest and best all left and the achievers all left” (BR practitioner #5). Most volunteers and interested participants, besides BR practitioners, come from the outside of the region. But implementing a greater variety of the community initiatives creates interest among youth and older generations alike. One BR practitioner explained that “people forget about it [activities related to the community project] and they sort of go on with their lives and it just sort of blends in. But you [practitioners and/or researchers] keep presenting new things, you keep giving new opportunities and more and more people buy in and become involved” (BR practitioner #2). These comments demonstrate some of the challenges that BRs face in rural areas.

4.2.4. Governance/Operational issues.

The board of directors of the RLBR is structured to represent the whole region of the reserve. Therefore, each municipal government in the reserve area appoints an employee to represent its Rural Municipality. Once appointed, the representatives are required to attend board meetings of the organization. At the same time, this structure does not guarantee that appointed individuals will be personally interested in actively participating in the RLBR’s operations, and has led to a varying level of interest among the board members. As one practitioner noted, the board members have “very different levels of understanding of why they are there on the first place. And the sort of general: oh, we should be here but don't really know why” (BR practitioner #5). Another practitioner stated that “sometimes you put a person towards that committee, that they are there in name but they don't actually do anything, because they don't have the time or the interest” (BR practitioner #3). As a result, there are differing levels of

understanding among the practitioners concerning common goals and vision of the BR, and these differences act as a barrier against better functioning of the organization (BR practitioners #3, 4, 5).

The operational division of the board into three sectors, education, culture, and science, works well for the organization. It allows members of the board to concentrate on distinct roles and responsibilities, with identified goals for each sector. Regular meetings of the board facilitate effective communication and ongoing discussions of where the RLBR stands and what it is planning to accomplish. However, due to the volunteer nature of the organization, such a structure of distributed roles and responsibilities requires the self-discipline and practical interest of the practitioners, in order to ensure the structure's effectiveness (BR practitioners #2, 4).

The board members face a few challenges when it comes to the operational activities of the organization. First, they often do not have enough personal time to devote to the meetings and activities of the organization. They simply do not have time to get involved. As a practitioner noted: "A lot of local people are too busy trying to manage their own farms, their own businesses, or whatever" (BR practitioner #3). Additionally, knowledge and limited educational background among practitioners create a lack of confidence when it comes to innovation for transition (BR practitioners #1, 3). The expertise of an external researcher, as a part of the board, has been sought after but is currently unavailable (BR practitioner #1). There is a lack of human capital to strengthen and facilitate learning, outreach, fundraising, pilot projects and other activities (BR practitioners #3, 5). The openness and transparency of proceedings are limited to only a few sources: newsletters, board meetings, and academic articles.

RLBR practitioners are limited to experimenting with new ideas and practices to the extent of which financial capital is available. Inconsistent funding may discourage and demotivate actors involved in the BR's activities. Nevertheless, BR practitioners strive for improvement and aim to engage young people to be part of the organization, so that knowledge and information can be transferred to new generations (BR practitioners #3, 5).

4.3. Definition and Key Factors of Collaboration

Collaboration as a general concept is well received by the researchers and BR practitioners. Both parties realize the importance of cross-communication and possible benefits associated with effective partnership. A researcher emphasized that "there is such a natural and

good and very underused cross-benefit to collaborating research and on-the-ground (sic) practices” (Researcher #2). A collaborative relationship between researchers and BR practitioners works as a tool for bringing science and practice together to achieve common goals and to produce positive results. Researchers indicated that working together with BR practitioners resulted in practical applications of scientific or expert knowledge into on-the-ground action. Thus, the outcome of the research is relevant to scientific knowledge, and, in turn, scientific knowledge can help make the practice happen (Researchers #2, 5). Ideally, mutual interdependence becomes a cornerstone of the project’s implementation process. Researchers and BR practitioners can make effective use of each other’s resources and skills (Researcher #4). They can help each other out, by delegating particular tasks to each other, to ensure a desirable outcome. Hence, at its best, collaboration between researchers and BR practitioners “will provide a project that has measurable achievements” (Researcher #3) and can be also beneficial to local residents (BR practitioner #4).

BR practitioners indicated that as long as research outcomes bring value to the organization, they are willing to collaborate, support, and provide as much information as possible to the researchers. As BR practitioner emphasized: “first of all [research projects] have to be shared with us and then [they] have to do something good for the community” (BR practitioner #4). Although RLBR practitioners do not always have financial support, they are the key players in opening the doors for researchers to talk to people, provide local knowledge about the surrounding environment, assist with logistics, and provide a space in the research center (BR practitioner #5). One practitioner noted: “We were more than eager to invite people in, that would help and have the same mindset as we [do]... We trust you [researchers] are doing a good thing, we are gonna do the best to help you [researchers] and that's how it worked out” (BR practitioner #2). Therefore, RLBR practitioners are willing to assist researchers, and researchers, simultaneously can gain a better understanding of the needs of the local residents (practitioners) , so as to provide information valuable to the organization (BR practitioners #3, 5).

All in all, based on the interviews and literature review, **collaboration between researchers and BR practitioners can be defined as a dynamic process, in which both parties work together for a mutually beneficial purpose, take into consideration each other’s circumstances and needs, and produce measurable outcomes.**

Interviewees confirmed previous definitions of collaboration in the literature and emphasized that collaboration requires measurable outcomes. This is an extension of previous definitions. For this process to be effective and to achieve expected results, key factors were identified by the interviewees (Table 4). These were not arranged in a hierarchy, because the question was asked as an open question; hence, one might not think of the particular factor at the moment of interviewing. The discussion of these factors in relation to the factors defined by the literature (Table 2) will follow later.

Table 4: Key factors of successful collaboration between researchers and BR practitioners, from the interviewees' perspective.

Key Factors of Successful Collaboration (Interviewees)
Willingness to be collaborative
Common goal/s
Mutual respect and appreciation of different backgrounds
Trust
Openness to new ideas
Open to the input from local people
Effective and transparent communication
Teamwork
Flexibility
Understanding of each other's skill sets
Laid out background rules (memorandum)
Information exchange
Equal interest and effort
Financial stability
Beneficial results for the community
Understanding of the community needs
Researchers' understanding of the BR concept
Encouragement (involvement of external agencies, outreach)
Collaborate if required

It is important to keep in mind that researchers and practitioners are working within the BR, and therefore have to consider the needs of local residents as part of the decisions made. The local residents are an integral part of the BR's overall functioning. Understanding the residents' needs represents a big step towards long-term effective collaboration, which can be forgotten if research is focused purely on the generation of new knowledge (BR practitioner #5, Researcher #5). BR practitioner noted: "Somebody cared about the people ... [was] open to input from local people and resources, sense of humor, understanding of community needs, it's not just all about the research project, but it's about what that means and why" (BR practitioner #5). The BR practitioners and the local residents expect to receive information from the researchers and possibly to put findings into practice (BR practitioner #4, Researcher #5). Practitioners emphasized that they are eager to invite people who understand what the RLBR stands for and who will help to develop the area (BR practitioner #2).

The research revealed that understanding each other's skill sets and expertise is a prerequisite for a mutually respectful collaborative relationship (BR practitioner #1, Researcher #6). Trust, and open and transparent communication are crucial in a project's implementation and successful outcomes (Researchers #1, 2, 6 BR practitioners #1, 5). These are often gained through the informal meetings, workshops, and/or focus groups held by researchers, and, as a result, they contribute to the exchange of information between researchers and BR practitioners (BR practitioners #1, 4, 5, Researcher #6). Encouragement and dedication to be part of the collaborative relationship and give input all the way through the project's implementation makes a relationship stronger and long lasting (Researcher #1, BR practitioner #6). For example, the AEGP started as a pilot project with the Redberry Lake watershed and has worked its way through the much wider network of Group Plans (see figure 5). Both researchers and BR practitioners were motivated to create a strong network. Now the RLW AEGP is surrounded by many other AEGPs. Collaboration through continuous communication was encouraged not only among the Group Plans but also with external agencies such as Nature Conservancy Canada and Ducks Unlimited, who were also interested in working in the area.

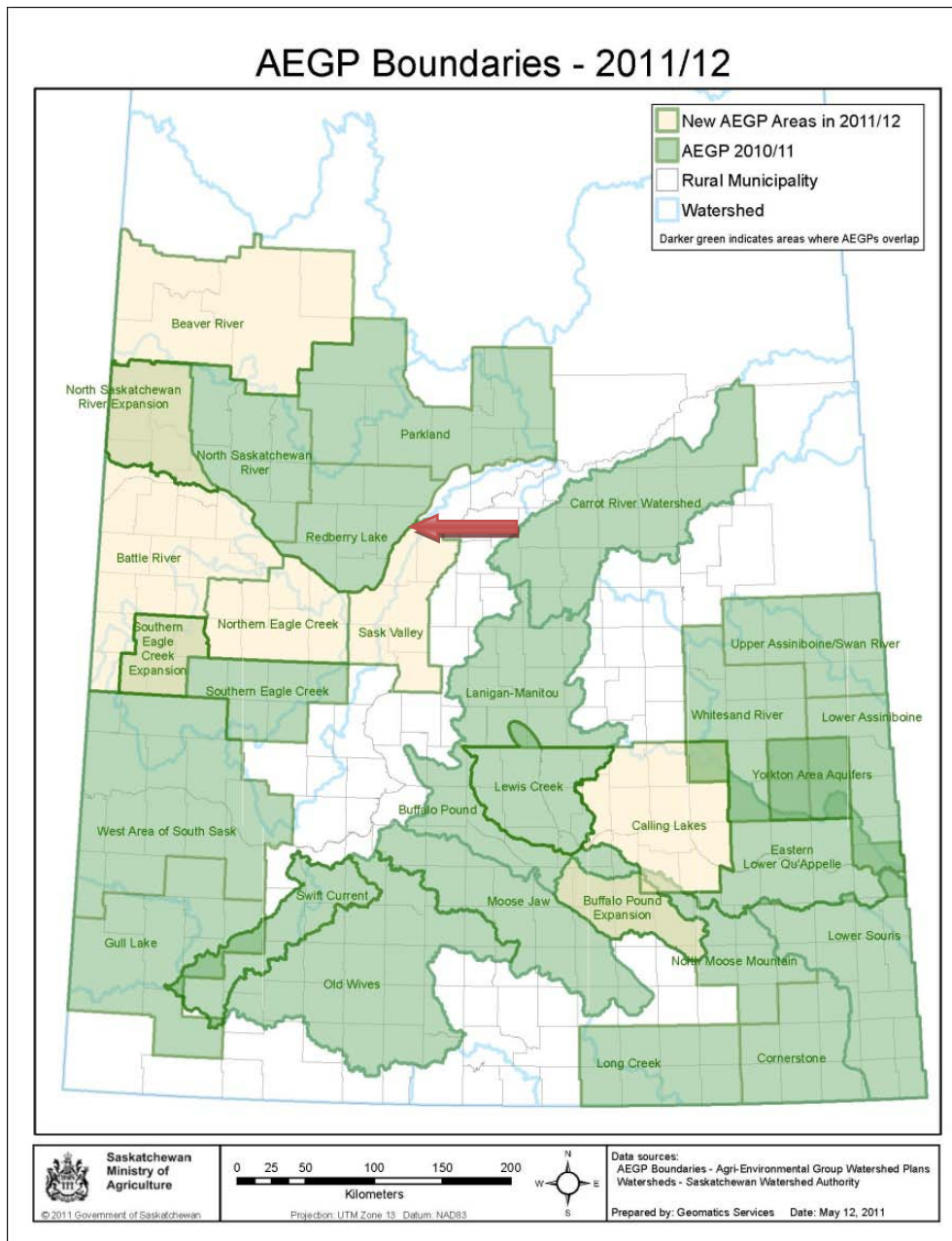


Figure 5: Agri-Environmental Group Plan boundaries for 2011-12. Source: Saskatchewan Watershed Authority. Prepared by: Geometrics Services, May 12, 2011.

Effective collaboration entails setting priorities and preparing action plans upfront (Researcher #4, BR practitioner #1), as well as confirming mutual goals between practitioners and researchers at the beginning (BR practitioner #2). A researcher emphasized that “having your objectives upfront and knowing what each group wants and then for what purpose possibly I guess you could say” is essential (Researcher #4). Communication between researchers and BR

practitioners has to be continuous (Researcher #2, BR practitioner #3) and aimed at engaging more partners, so that funding possibilities can be leveraged (Researcher #3). As the project progresses, critical reflection on the accomplishments, gaps, and further steps is necessary to keep track of the progress (Researcher #6). “Ongoing checking in with each other to see whether things are ok” is an important part of the process (Researcher #6). These comments suggest that participants should clarify ongoing roles and responsibilities.

4.4. Three Types of Research Collaboration

At the beginning of my study I selected three different initiatives of effective collaboration, according to the functions of the BR and other criteria. They represented the conservation of biodiversity, sustainable development, and logistic support functions. By doing so, I was able to learn the respective roles and responsibilities of the researchers and BR practitioners, separately from each of the functions with which they are associated. The research revealed that working together was not required at all times. Both researchers and BR practitioners agreed that it is important “to collaborate if it's required, there is no sense doing it if it's not required to answer the question” (Researcher #5). Researchers and BR practitioners who worked towards biodiversity conservation function did not perform main research tasks together, as compared to the initiatives focused on sustainable development and logistic support functions. Thus, the type of research being conducted influences the expected levels of engagement and responsibilities of researchers and BR practitioners. Moreover, key lessons and outcomes of each of the initiatives were identified by the stakeholders and as a result provided a more fulsome picture of the research collaboration. The following subsections are ordered according to the functions of the BR and include the respective roles and responsibilities of each of the initiatives separately.

4.4.1. Studies on White-Winged Scoters.

The studies on White-Winged Scoters were important for the biodiversity conservation function of the RLBR. During the research, collaboration between researchers and BR practitioners did not require frequent communication. Nevertheless, researchers always felt welcomed and supported. Both researchers and BR practitioners were very satisfied (5 on a scale

from 1 to 5) with a level of collaboration they had (Table 5). They were willing to share information with each other. Being informed about the course of the study helped the BR practitioners to keep the local residents aware of the circumstances present on the site.

Table 5: Individual rating of the level of satisfaction (n=13) with collaborative relationship between researchers and BR practitioners within each initiative (1 – not at all satisfied; 2 – not really satisfied; 3 – neutral; 4 – somewhat satisfied; 5 – very satisfied).

BR practitioners						Researchers					
Initiatives	1	2	3	4	5	Initiatives	1	2	3	4	5
RLW AEGP				•		RLW AEGP					•
					•						•
WWS					•	WWS					•
					•						
ACC					•	ACC					•
					•						
					•						
					•						

4.4.1.1. Roles and responsibilities.

At the very beginning, researchers shared with the BR practitioners what the study was aiming to achieve. The BR practitioners welcomed the research and had some active presence on the lake too (Researcher #4, BR practitioner #3). The researchers took the leading role in designing the project, taking care of the logistics, obtaining permits, hiring the technicians, etc. Although the type of the study did not require close collaboration with the BR practitioners to make it happen, the researchers appreciated the presence of the practitioners. The BR practitioners could always show and explain local specifics to the researchers. Researchers ensured that open and continuous communication with the BR practitioners was always present along the course of the study (Researcher #4). BR practitioners were responsible for keeping the general public up-to-date with the research being conducted on the lake (Researcher #4, BR

practitioner #5). They were not so much involved in the process of the research per se, but indirectly participated through encouragement, provision of the office space, and other resources as needed (BR practitioner #3).

4.4.1.2. Key lessons and outcomes.

The researchers realized the importance of the open and continuous communication with the BR practitioners. There was mutual respect and understanding of the each other's backgrounds (Researchers #4, 5). This collaboration introduced researchers to the concept of a BR (Researcher #4). The researcher said "I had no clue what the BR was until I worked there for the last decade". As a result, a collaborative relationship helped to bring the word about the BR out to the public during the information dissemination process and attract more researchers to the site. It was important for the BR practitioners to collaborate with researchers in order to identify the issues related to the biodiversity conservation and receive professional advice on how to deal with them (BR practitioner #3).

The researchers were able to accomplish the goals that were set up at the beginning. They documented the basic population biology of the White-Winged Scoters, their nesting success, number of the birds on the lake, the ducklings' survival, contaminant level in the birds' blood, etc. The results were published as a progress report and in academic articles (Alisauskas et al., 2010; Traylor & Alisauskas, 2006).

The lack of financial support from both sides made it challenging to continue similar ongoing research studies (BR practitioner #4, Researcher #5). The long-term research program was not realized due to the funding cuts (Researcher #4). The researcher noted: "we have pretty good information on age of recruitment[,] but the annual duckling survival which is probably pretty critical, we just don't have the resources to grasp that" (Researcher #5).

4.4.2. Redberry Lake Watershed Agri-Environmental Group Plan.

The RLW AEGP was responsible for the sustainable development function of the BR. This initiative had researchers and BR practitioners working closely together, during the process of implementation. Almost all stakeholders were very satisfied (5 on the scale from 1 to 5) with the level of collaboration (refer to Table 5) including the progress and outcomes of the initiative. Only one person rated himself/herself as somewhat satisfied (4), reasoning that there is always

room for improvement. Along the course of the project's development, BR practitioners and researchers had differing intensities of collaboration. At the beginning stage, there was much closer collaboration and attention to the details than later in the process. Once mentoring extended to reach the new technicians and once consistency was achieved, researchers and BR practitioners put less emphasis on the monitoring activity (Researcher #2).

4.4.2.1. Roles and responsibilities.

The group plan board, including both researchers and BR practitioners, looked into the issues and suggestions that came from local farmers. They gave recommendations and provided required support (BR practitioner #3). As the project advanced in its operations, new technicians were recruited, while experienced partners took roles as mentors (Researcher #2).

Researchers assisted BR practitioners and local farmers in getting accustomed to the educational component of the initiative, such as required reports and some operational activities (BR practitioner #3, Researcher #3). Also, the RLW AEGP collaborated with a researcher from the Ministry of Agriculture, who acted as an advisor and who supported and advised on day-to-day activities (Researcher #2).

Together, researchers and BR practitioners participated in the planning and decision-making, which helped to define the direction of the program. Regular communication and critical reflection were main strategies in keeping track of the progress. Workshops were organized jointly. Both parties were willing to collaborate and contribute (Researchers #1, 3). Close collaboration was also an important part of the community outreach activities, where the unity and the range of expertise played an essential role in gaining trust from the public (BR practitioner #1). BR practitioner said that working together entailed “also where you stand together in public as a united force; where you have to be seen that you are together on that collaboration, so that you encourage people to take part in what it is you are trying to achieve” (BR practitioner #1).

BR practitioners streamlined their activities towards the implementation of the beneficial management practices, among the local farmers. Those practices are defined as agricultural management practices that aim to minimize environmental risks, ensure sustainability of the land-related resources used for agricultural production, and support economic viability of the agro producers (PCAB website).

BR practitioners provided open and transparent external and internal communications. They communicated with the Rural Municipalities, the Agri-Environmental Services Branch, and consulted with other external agencies (BR practitioners #1, 3). The whole region of the BR was represented and community needs were taken into consideration.

4.4.2.2. Key lessons and outcomes.

The RLW AEGP became a very successful initiative that gained community acceptance and the trust of local residents, as well as good working relationships with government agencies and ENGOs such as Saskatchewan Watershed Authority, Ducks Unlimited, and Nature Conservancy Canada (Researchers #1, 3, BR practitioner #1). Having financial assistance for the specific projects, such as fencing (273 projects), portable windbreaks (83 projects), portable calf shelters (44 projects), grass seeding (40 projects), alternative water systems (56 projects), creek crossing (5 projects), predator fencing (3 projects), buffer (5 projects), and well decommissioning (8 projects), helped local farmers to realize some of the important environmental issues that affected their farms and the watershed in general (Kindrachuk, 2011). This initiative enabled local people to think in the terms of sustainability and relate to the functions of the BR (BR practitioner #1). One practitioner emphasized that “It’s a window or a mechanism for us to be able to softly and slowly introduce [the] BR concept to the landowners” (BR practitioner #1).

Open and transparent communication with local farmers was noted as one of the most effective ways to have a long-term, successful relationship. Creating the link to the agricultural community strengthened the BR as an organization (BR practitioner #1, Researcher #2). At the same time, it was important to be persistent and patient in gaining trust and support from local residents and external agencies (Researcher #1). The researcher said that “it takes time for people or the landowners or the rural municipalities to understand the benefits of [a] project like this, and once they did understand that or see their neighbours involved, then not a long time before they would get involved also” (Researcher #1).

Practitioners and researchers agreed that when local residents and landowners are part of a collaborative process with researchers and BR practitioners, they appreciate the work done and are ready to participate in the initiatives. This way, results of the research undertaken were more readily accepted by the people who make use of the information. Researchers observed that a

greater variety of participants in the initiative brought different values and greater accomplishments rather than a more limited circle of participants would (Researcher #3).

RLW AEGP helped local producers to take care of the environment on their land by encouraging them through small-scale projects. As a result, the initiative brought the BR closer to its goals and vision (BR practitioner #3).

4.4.3. Community Capacity Assessment.

The assessment of community capacity was a community-based research study. It helped to assess the community capacity of the RLBR and recommended further steps for its development. Due to the academic nature of the initiative, the researcher and BR practitioners had a very close, collaborative relationship when collecting data for the project and much less collaboration towards the end. Both researchers and BR practitioners were very satisfied (5 on the scale from 1 to 5) with the collaboration and the outcomes of the research study (refer to Table 5). It was an interesting, engaging, educational process for the BR practitioners and for other local residents (BR practitioner #1).

4.4.3.1. Roles and responsibilities.

BR practitioners were supportive of the research and willing to collaborate, as needed. Practitioners provided necessary documentation and office space, introduced the researcher to the key individuals, helped to arrange day-to-day necessities, and were involved in all of the events organized by the researcher (BR practitioners #5, Researcher #6). BR practitioners were also eager to give interviews and fill out the questionnaires (Researcher #6). The RLBR board was very interested to know the results of the study (BR practitioner #2).

Identifying the research gap, purpose, and objectives were the responsibilities of the researcher. The outline of the research was presented to the BR practitioners at the beginning of the process. Planning and financial support were offered by the researchers. Presentation of the intended research study and the following information-sharing gained trust between the BR practitioners and the local community. The researcher also verified the results with the BR practitioners and kept them informed about the progress of the study (BR practitioner #6).

4.4.3.2. Key lessons and outcomes.

The researcher was able to engage the local community in the research study through workshops, informal communication, focus groups, and other events organized for the local school. Collaboration among a researcher, practitioners, and local residents was appreciated by the participants. One practitioner reflected on her/his experience: “More is possible than I thought. Because sometimes you stay in your community and you see a lot of close mindedness, but if you open it up and you let people in, you realize that, you know, people just get exposed to these things and they are open to them” (BR practitioner #2). The researcher understood the community needs, was open to new ideas, and shared knowledge about the research study throughout the process (BR practitioners #2, 6). There was a very friendly atmosphere; the researcher was highly-respected and trusted (BR practitioner #5). Hence, the researcher received support, help, time, and contacts from the BR practitioners (Researcher #6).

As a result of all the work that was done, the local residents, for the first time, were introduced to the concept of a BR at large and what it aims to accomplish. The study allowed local residents to work with a researcher for the first time (BR practitioner #3, 5). The BR practitioners appreciated all the effort made by the researcher and were able to see the strengths and weaknesses of the organization. “It was an excellent, excellent project and did really did bring people together and I think it was a first real eye-opener for the community to see” (BR practitioner #2). Practitioners realized that community engagement was an essential part of the BR’s efficient functioning. The RLBR needed more local involvement and had to be more open about the objectives and activities of the organization (BR practitioner #1).

The research resulted in the publication of a thesis (Mendis, 2004), academic articles (Mendis-Millard & Reed, 2007), and poster presentations. The BR could apply the findings of the study and was able to engage more people in the activities of the organization during the initiative’s implementation (BR practitioner #1, 5). Once the study was completed, however, active community involvement narrowed to include only the board meetings, due to the lack of time and encouragement from the outside experts (BR practitioner #2, 5). BR practitioner noted: “[I]t [research study] needs to be continued and, you know, that's difficult to do because it's a small community with a lack of people here, or we cannot expect university groups [to] always help us out” (BR practitioner #6).

4.5. Evaluation of the Factors of Collaboration during the Initiatives

Looking back at the three initiatives for collaboration and their associated requirements and implementation processes helps one understand the prerequisites for its success. The key factors of collaboration were drawn from the literature and evaluated by the interviewees (see Tables 6.1 and 6.2). Findings revealed that respondents' explanation behind the rating is more important than an arithmetic mean of a rating range. Individual rating is also valuable due to the small sample size. As a result, the comparison of the factors among three different initiatives – Agri-Environmental Group Plan, studies on White-Winged Scoters, and Community Capacity Assessment research study – in relation to the significance of each factor is demonstrated. This comparison provided the opportunity to look at the collaborative process under three different circumstances, where varied levels of engagement by researchers and BR practitioners were needed. The study showed that although each factor is important, different initiatives require different sets of factors; hence collaboration has to be tailored to the situation. The following descriptions of each of the factors demonstrate this finding.

Table 6.1: Factors of collaboration evaluated by the researchers (1 – not important; 2 – somehow important; 3 – important; 4 – very important; and 5 – extremely important).

Evaluated factors of collaboration	Interviewees' recommendations	Importance																	
		RLW AEGP						WWS						ACC					
		1	2	3	4	5	n	1	2	3	4	5	n	1	2	3	4	5	n
Setting clear goals for the project together	Agreeing on the goal					•	2		• 2	•			3			•			1
Planning the project together					•		2			•			2			•			1
Adequate finances					•	•	2	•				•	2					•	1
Trust					•		2				•	•	2					•	1
Communication and information exchange					•		2					•	2					•	1
Performing research tasks together			•				2			•		•	2		•				1
Monitoring together		•		•			2			•			2	•					1
Evaluating results together	Verifying the results	•			•		2	•	•				2					•	1
Making decisions together	Critical reflection/ review				•	•	2	•	•				2				•		1
Gained knowledge and understanding				•	•		2					•	2					•	1
New and improved relationships					•		2			•		•	2				•		1
	Support of institutions			•			1					•	1					•	1

Table 6.2: Factors of collaboration evaluated by the BR practitioners

Evaluated factors of collaboration	Interviewees' recommendations	Importance																	
		RLW AEGP						WWS						ACC					
		1	2	3	4	5	n	1	2	3	4	5	n	1	2	3	4	5	n
Setting clear goals for the project together	Agreeing on the goal					•	2					•	2		•		•	•	5
Planning the project together						•	2	•				•	2			•	•	•	5
Adequate finances						•	2	•				•	2	•		•		•	5
Trust						•	2					•	2					•	5
Communication and information exchange						•	2					•	2				•	•	5
Performing research tasks together					•	•	2			•	•		2		•		•	•	5
Monitoring together					•	•	2	•				•	2	•	•				5
Evaluating results together	Verifying the results				•	•	2	•				•	2		•	•	•	•	5
Making decisions together	Critical reflection/ review				•	•	2	•				•	2	•		•	•	•	5
Gained knowledge and understanding					•	•	2				•	•	2				•	•	5
New and improved relationships					•	•	2				•	•	2				•	•	5
	Support of institutions				•		2					•	2					•	5

The first factor that was evaluated by the researchers and BR practitioners was “setting clear goals for the project together”. While this factor of collaboration is an important factor, it did not apply to all three projects. Due to the academic nature of the ACC project, researchers had to follow their own requirements, thus “agreeing on the goal” was emphasized as a better alternative. The WWS study had a difference of opinion: BR practitioners felt that this factor was extremely important (5 out of 5), while the researchers did not see such significance (2, 3 out of 5). BR practitioners were willing to be part of the research studies carried out on the territory of the BR. For the AEGP project, both researchers and BR practitioners agreed on the significance of this factor. The first factor was extremely important (5 out of 5) that both groups both set and agree on the goals together, as doing so helped to achieve the goals of the project.

The second factor was “planning the project together”. This factor was rated from important (3) to extremely important (5) for the ACC research study. It was noted that community wanted to be engaged and to be able to provide the information and local knowledge for the researchers. For the studies on WWS, planning together was not important (1), but instead informing the BR practitioners and local residents about the objectives of the study was (5). And researchers also confirmed the importance of that (3). Researchers and BR practitioners, during the AEGP initiative, rated “planning the project together” as either very important (4) or extremely important (5). Yet, this factor was considered by stakeholders as less important than “setting clear goals together” at the beginning of the project.

The third factor of collaboration was “adequate finances”. Both researchers and BR practitioners, regardless of the type of the project, emphasized the importance of sufficient funding. At the same time, some noted that money was not a driver of either quality work or of efficient collaboration. One BR practitioner said: “It [the research study] was driven by the people not the money” (BR practitioner #5). So adequate finances were crucial for the continuation of the projects, but not necessarily for the strength of the collaboration itself.

The fourth factor was “trust”. Across different collaborative relationships, trust was identified as a very or extremely important (4-5) factor. Trust among the actors involved in the project, trust from the local residents, and trust with external agencies were all significant for the project to be implemented successfully. The study on ACC demonstrated that once the local residents saw a researcher as a trustworthy person, they were willing to share the information openly and assist in other research activities. The RLW AEGP initiative has also gained trust

from the local residents, which in turn enhanced the project's progress. The findings of my research suggest that a researcher has to establish trustworthy relationships with BR practitioners by introducing to them the research study, and by sharing the researchers' intentions and information with them. BR practitioners mentioned that they trust the researchers who understand the concept and mandate of the BR and who intend to conduct the study that potentially could help the BR to meet its goals.

The fifth factor was "communication and information exchange". BR practitioners and researchers considered this factor to be either very important (4) or extremely important (5). BR practitioners always wanted to be informed about the initiatives to some degree. Strong communication and information exchange facilitated trustworthiness between researchers and BR practitioners. BR practitioners wanted to be informed either about the process or merely about the findings, depending on the initiative. The AEGP and ACC initiatives acknowledged communication and information exchange as a main factor for effective collaboration and later success. For researchers, local knowledge was a valuable input and a sometimes compulsory part of their work. Also, information was disseminated in the form of published articles, reports, and/or theses, was one of the main goals of the researchers.

The sixth factor of collaboration was "performing research tasks together". The significance of this factor ranged from somehow important (2) to extremely important (5). For the initiative that focused on the function of biodiversity conservation, joint task accomplishment depended on whether the BR could contribute to and/or benefit from it. For example, such tasks could entail removing the predators on the lake or the placement of the weather station for data collection. As for other initiatives, this factor depended very much on the situation.

The seventh evaluated factor was "monitoring together". *Joint* accomplishment of this factor by the researchers and BR practitioners was noted as not being important (1), but instead as merely accomplishing the task—monitoring was rated from important to extremely important (3-5). Both researchers and BR practitioners agreed that it was more important to communicate and exchange information rather than to "monitor together".

The eighth factor was "evaluating results together". Researchers and BR practitioners rated this factor from 1 to 5, depending on the meaning of the factor. For one researcher, verifying the results was extremely important (5). The researcher emphasized that "that's an opportunity for people to think about your research and the findings ... I wouldn't say evaluating

your results together, but I would say at least verifying your results or giving an opportunity for people to comment on the results” is most important (Researcher #6). By contrast, for other researchers and BR practitioners, informing each other of the results was enough to constitute successful collaboration. Both groups needed to know “how well the project was doing as far as finances, and number of projects, and accomplishment” (Researcher #1).

The ninth factor of collaboration was “making decisions together”. For the BR practitioners of the ACC and WWS research studies, doing this together was either not important (1) or extremely important (5). These two opposite responses reflect that the BR practitioners have different opinions about their involvement in the process; either way the practitioners wanted to be informed about the decisions made. This was emphasized by the recollection of the BR practitioners’ previous experience in working collaboratively, in which “they [researchers] were never a good sharing with people about what they were doing, they were very scientists in white coats” (BR practitioner #5). In the case of an academic study, researchers preferred to reflect critically or to review with the BR practitioners, rather than to shape the process together. “Researchers have their own criteria; we cannot compromise our research so that we compromise our independence” (Researcher #6). And for the initiative focused on the sustainable development of the BR, both researchers and BR practitioners were consistent with their ratings and agreed that making decisions together was either very (4) or extremely important (5).

The tenth factor was “gained knowledge and understanding”. This factor was rated from important (3) to extremely important (5) by both researchers and BR practitioners. Researchers identified this factor as being one of the main purposes of completing a study. From the perspective of BR practitioners, this factor played a role in better understanding and further developing the BR.

And lastly, the eleventh evaluated factor was “new and improved relationships”. Both researchers and BR practitioners thought that it was very (4) or extremely important (5) to have either new or improved relationships. The BR was striving to have more or better collaboration with external agencies, NGOs, and academia.

One more factor of collaboration that was added by the researcher was to have the “support of institutions”. This factor was also supported by the rest of the key informants and rated as either very (4) or extremely important (5). “Because the success of the project depends

on the support like I said [of] the University of Saskatchewan, non-governmental organizations, like Ducks Unlimited Canada, and the Biosphere Reserve because they helped out as well as federal government ... That's success in my eyes, you know, put into over hundreds of thousands of dollars” (Researcher #4).

4.6. Opportunities and Challenges of Collaboration at the RLBR

Any type of collaborative relationship poses opportunities and challenges which have to be faced by the stakeholders and by an organization as a whole. The BR practitioners and local residents can benefit from the successful initiatives in different ways. Local residents can use the knowledge derived from the collaboration, in the form of the results of the research, as in the case of the WWS and ACC; or in the form of practical application of the recommendations, given by the researchers, as seen through the AEGP initiative. When local residents are part of a collaboration that is directed towards better performance of the region, any results of the initiative are more readily accepted by the people, as they can make use of the information (Researcher #3).

Collaboration with external agencies and universities can help the BR to identify the present issues, as well as receive recommendations on how to deal with them. BR practitioners benefit by acquiring new knowledge, information, and better understanding of the issues (Researcher #6). As one researcher mentioned: “You are getting more by collaborating, you are taking advantage of people's expertise” (Researcher #4). A collaborative relationship is an opportunity for practitioners to receive technical expertise on the site, and thereby accomplish the tasks professionally (BR practitioner #3, Researcher #4, 5). Researchers, on the other hand, benefit from having BR practitioners and local residents on their side. Researchers gain local knowledge and can rely on the support when needed. Working together allows the BR practitioners and researchers to explore each other's skill sets, and to get to know new contacts and new opportunities (Researcher #4).

Collaboration also serves the BR as a way to get funding and to implement the initiatives that would fulfill the functions of the organization (BR practitioners #3, 6). Collaboration provides multiple possibilities: either the BR practitioners prepare a proposal and look for the partners, or researchers approach the BR to implement the initiative. In the case of the RLBR,

researchers approached the organization with the intention of establishing a collaborative relationship and/or conducting research studies on the site.

Working together with the researchers is also an opportunity for the BR to get the word out about the organization and its mandate. The organization gets publicity through published articles, presentations at the conferences, and informal communications (Researcher #4, BR practitioner #6). This helps other researchers and the general public to become more familiar with the concept of the BR. One BR practitioner mentioned that collaboration “creates awareness about BR hopefully, which acquires greater understanding and cooperation with the community as well as maybe other governing agencies that could help with funding for it” (BR practitioner #6).

The BR practitioners’ participation in the initiative is often limited by the lack of the BR’s available funding. This results in the challenge of devotion of personal time by the BR practitioners, as they are mostly volunteers and have to look after their own farms (BR practitioner #5). Additionally, having more staff could help with assisting researchers to conduct their studies (Researcher #4). The BR practitioners do not have the opportunity to initiate the projects that would meet the organization’s goals but rather have to use the external opportunities (BR practitioners #4, 5).

When the studies are conducted *in* the BR rather than *about* it, researchers are often unfamiliar with the concept and mandate of the organization (BR practitioners #4, 5). Lack of knowledge might create misunderstandings and conflict between the parties. Since the BR welcomes research, the practitioners expect to be informed about the initiative’s process and findings. The discussion around the effectiveness of collaboration under different circumstances is presented in the next chapter.

CHAPTER 5: DISCUSSION

5.1. Introduction

This chapter discusses the main findings of this thesis, and demonstrates how they reflect and/or complement the literature reviewed. Discussion is structured around the objectives of this study, and refers to the collaboration between researchers and practitioners through the lens of the functions of the BR (section 5.2). Further, the roles and responsibilities of researchers and BR practitioners are discussed and summarized in the Table 6 (section 5.3). A comprehensive table of factors of collaboration is suggested based on the findings of this thesis (section 5.4). And lastly, opportunities and challenges of collaboration between researchers and BR practitioners are discussed in section 5.5.

5.2. Collaboration between Researchers and BR Practitioners

There is always a room to improve the collaborative process; to have more connections, more organizations or agencies involved, and to create strong collaboration among the BRs nationally and internationally. Collaboration with various organizations is also a means to distribute knowledge about the BR and its activities. Communication and presentations by the board members and researchers at various venues increase the public awareness and ensure the openness and transparency of the organizations' activities.

For a collaborative relationship to develop, there must be a mutual understanding that different initiatives have specific expectations, and thus that collaboration has to be tailored to the situation. The study revealed that collaboration of the initiatives in biodiversity conservation, sustainable development, and logistic support functions have varied levels of expected engagement from the participants. This finding is discussed in the following subsections.

5.2.1. Biodiversity conservation function.

When collaborative management is applied to the initiatives and/or research where natural scientists are key experts, it is important to recognize what a collaborative process requires (Lauber et al., 2011). A BR usually hosts these types of initiatives to support the biodiversity conservation function. While all of the factors of collaboration are seen as

important, there are some that are more significant in achieving efficient collaboration in this setting.

Joint accomplishment of the tasks, such as setting goals and field work protocols, is not particularly significant when it comes to the projects around biodiversity conservation. In the case of the RLBR, I found out that researchers tend to work independently and they usually come to a BR to conduct a study with pre-defined goals. Nevertheless, it might be useful to discuss the research process together with BR practitioners so that other social, cultural, and economic goals are also taken into consideration (Berkes, 2004). My findings suggest that it is important that the researchers are familiar with a BR's concept and its mandate, prior to conducting their study on the BR site. Awareness about a BR's willingness to promote and utilize the findings of the research creates a relationship that is mutually beneficial.

If scientists share their opinions with the public while they are still in the middle of their research, they might unwittingly give the impression that they drew their conclusions prematurely, and thereby might sabotage their own credibility. Therefore, natural scientists often do not share their findings until the end of their research project, in an effort to avoid bias in the research process (Kaiser, 2000). Communication and information exchange then becomes more one sided, as information is disseminated with a help of published reports and/or articles. BR practitioners, however, expect to be informed about the process and/or findings. Hence, my findings suggest that researchers have to present their findings in a jargon-free style and be open to hearing comments from the practitioners. It is still an ongoing issue and can be resolved by arranging presentations of the findings, once the research study is completed.

In the case of the RLBR, researchers who were aware of the local residents' needs had the most effective collaborative relationship with practitioners. In general, BR practitioners are examining ways to improve the functioning of the BR that involve local residents. Therefore, informing local residents about the ongoing initiatives at the BR, through communication channels such as a website, newsletters, and workshops, is important and has been practiced at the RLBR. Again, working together is not mandatory, but the needs of practitioners and local residents have to be taken into consideration when pursuing research study on the site. Researchers, on the other hand, can benefit from local knowledge, while conversing with the BR practitioners (Mendis-Millard & Reed, 2007). This mutually respected approach to a collaborative process brings fulfillment to both sides.

My findings suggest that the aim of the researchers is to gain knowledge and understanding of a particular phenomenon, while the BR practitioners hope to develop a network of relationships and to benefit from the findings of the research that is undertaken. Both practitioners and researchers collaborate by exchanging information, which occurs throughout the process of the study. When researchers and BR practitioners have different backgrounds, it is especially important to have mutual respect and trust to collaborate effectively (Wondolleck & Yaffee, 2000; Pfueller, 2008; Leong et al., 2011).

5.2.2. Sustainable development function.

In the case of the RLBR, I discovered that the sustainable development initiative required much closer collaboration between researchers and BR practitioners than the biodiversity conservation initiative. Practitioners and researchers shared a common goal and were willing to collaborate as much as possible in order to achieve that goal. Findings suggest that setting and/or agreeing on the goal is an initial step towards deciding upon a clear process. While other initiatives might require that different approaches be adopted for collaboration to occur, most of the factors would be present during the project's implementation.

According to my findings, planning for the project is usually done together, therefore requiring mutual understanding and respect between parties of their differing backgrounds and skills (Wondolleck & Yaffee, 2000; Pfueller, 2008) are essential. As a general practice, continuous communication and information exchange have to be present during the project's implementation process. At this point in time, there is a need to improve networking among the rural municipalities involved in the RLW AEGP project, which could be attained through the online platform and/or website. Although this initiative is spreading to other regions, researchers and BR practitioners would like to see even more collaboration happening that streamlines their effort towards fundraising and toward creating a proposal that would secure stable funding.

When researchers and BR practitioners join in an effort to achieve a mutual goal, they also have to be ready to share benefits and costs (Lockwood et al., 2006), power and responsibilities (Berkes, 2004; Lauber & Decker, 2011). In the case of the RLBR, planning the project together at the initial stage was more important than jointly accomplishing other tasks. And once trust and effective communication were established, independent performance was

satisfactory. Generally, both researchers and BR practitioners have to remember to be flexible and adaptable (Wondolleck & Yaffee, 2000; Leong et al., 2011) to the changes in the plans and/or priorities of each of the sides.

My findings suggest that evaluating the results of the initiative helps to keep track of the progress. But at the same time evaluation does not always have to be done together. Nevertheless, researchers and BR practitioners have to keep each other informed about the progress, pitfalls, or any other updates at all times. Once the initiative requires close collaboration between researchers and BR practitioners, my findings are in line with the arguments by Innes & Booher (1999), suggesting that it is important to make decisions together. Both sides are equally engaged and responsible for successful outcomes; therefore, joint participation in the decision-making is preferable.

In the case of the RLBR, I found out that local residents usually expect to have tangible results from the projects on sustainable development. Hence, they are willing to collaborate and contribute to the project's implementation from the beginning. My findings suggest that this makes collaboration is more resilient to difficulties which may occur during the process of a project's implementation.

Successful collaboration between researchers and BR practitioners at the RLBR was a result of trust between researchers and practitioners; a continuous exchange of communication and information; encouragement, in the form of receiving funding and reaching tangible outcomes; as well as consideration of the local residents' needs.

5.2.3. Logistic support function.

One of the functions of the BR is to support research; therefore, community-based initiatives are welcomed and supported. It is important to inform researchers about the mandate of the BRs, so they can look into the research possibilities and create collaborative relationships with the BR practitioners. Once researchers become aware of the purpose and functions of the BR, more research can be conducted in the territory of the organization.

There are research studies that are being conducted *in* the BR and *about* the BR. I found out that when research studies are conducted *in* the BR, it is not necessary to collaborate per se, but rather to be aware of the BR as an organization, and its mandate. This is a case with research

studies that are merely focused on biodiversity conservation. Researchers are encouraged to inform others about the findings in the form of presentations or information sessions, which could contribute to the sharing of knowledge and to local residents' better understanding of what is happening in the BR's region. Research studies focused around the BR's concept pay close attention to the thoughts, ideas, and/or concerns of the local residents. These initiatives generally focus on the development, gaps, and potential of the organization. Researchers and BR practitioners performed both separate and joint tasks in the case of the RLBR.

My findings suggest that when community-based research is conducted, close collaboration between researchers and BR practitioners occurs primarily during the data-collection period. This finding was also supported by Castleden et al. (2012), stating that data collection is the period of the closest collaboration between a researcher and community members. Sometimes researchers have to follow the guidelines set in place beforehand; therefore BR practitioners are minimally involved in setting goals with the researchers. Nevertheless, this study reveals that it is important to come to a mutual understanding and to make sure that both sides agree on the goals.

I learned that planning and making decisions usually falls onto the researchers' side of the spectrum during community-based research studies. That finding is also in line with arguments by Castleden et al. (2012). As BR practitioners and local residents give their input and assistance when required, they expect to be informed about the findings and wish to benefit from the study. It is a researcher's responsibility to be honest, to respect the rights of the participants, and to provide confidentiality.

The BR supports research, and when scientists come forward with an idea or proposal, the BR practitioners usually are not responsible for the financial support. External projects bring external expertise and innovative ideas to the area, and, depending on the nature of the initiative, can create better collaboration among the local residents and uplift community spirit, as occurred during the ACC initiative. These are some of the reasons why the BR is interested in attracting more researchers to the site.

My findings are consistent with academic literature about BRs (e.g. Pfueller, 2008), suggesting that for the researcher to work effectively within the BR region, local support is essential. At the same time Castleden et al. (2012) supports this idea when it is transferred to the Indigenous communities. It is not only the BR practitioners who can assist in providing

information and working space, but also the local residents who hold local knowledge, as in the case of the RLBR. Therefore, trust in the researcher is vital and also results in further collaboration with the researchers in the future. The researcher has to make sure that communication is transparent and continuous.

It is possible to secure an exchange of information in the form of published articles, thesis, poster and oral presentations, as well as informal communication between researchers and BR practitioners. Such a channel of communication as an online platform for the BRs can also be one of the methods by which to exchange the information. Findings of the research can also be published on the BR's website.

In community-based research studies, most of the tasks, such as defining a research gap and data analysis, are done independently by the researchers. And both researchers and BR practitioners agree upon this way of accomplishing the research tasks, as in the case of the RLBR. Researchers make decisions regarding the flow of the research on their own and thus have flexibility in the way in which they form a project. My findings suggest that working separately makes the information exchange factor particularly important, so that researchers should not overlook this factor.

As a result of the research study, the researchers and BR practitioners gain knowledge and understanding of a particular question. It is important for a BR to implement the findings into the practice and keep track of progress of the research. In the case of the RLBR, I found out that new and/or improved relationships that occurred as a result of the study benefit the organization. Therefore, outreach to external agencies, NGOs, and academia, which is performed by the BR practitioners, must be present at all times.

5.3. Roles and Responsibilities of Researchers and BR Practitioners

Table 7 summarizes the roles and responsibilities of researchers and BR practitioners that were taken from the literature and also identified through the interviews. The responsibilities are divided between researchers and BR practitioners and further distributed among three functions of the BR. Three different initiatives that were selected according to the functions helped to achieve this task. Such an arrangement does not intend to prove that responsibilities are mutually exclusive. In other words, a responsibility listed under the biodiversity conservation function can

be related to the sustainability development function, if other circumstances prevail. Further discussion follows in this section.

Table 7: Comparison of the roles and responsibilities of researchers and BR practitioners identified through interviews and literature review.

Roles and Responsibilities

Function	BR Practitioners	Researchers
Biodiversity Conservation	Provide local knowledge	Inform about the purpose and findings of the research
	Act as a liaison between researchers and local residents	<i>Independent planning and decision-making</i>
	Provide necessary documentation & office space	Consider local knowledge
	Provide assistance if required	Obtain research ethics' approval
Sustainable Development	Strengthen outreach function	Provide recommendations and required support
	Share power, benefits, and costs	Share power, benefits, and costs
	<i>Participate in joint planning and decision-making</i>	<i>Participate in joint planning and decision-making</i>
	Have critical reflection of a progress	Have critical reflection of a progress
Logistic Support	<i>Ensure that local residents' needs are taken into consideration</i>	
	Introduce to the key informants	Inform the purpose and findings of the research
	Take part in data collection process	<i>Independent planning and decision-making</i>
	Provide assistance if required	Obtain research ethics' approval
		Consider local knowledge

Note: Plain text in Table 7 indicates information derived from the interviews; bold text indicates information derived from literature reviewed; and bold and italicized text indicates both.

Collaboration is often portrayed as an idealized process. In practice, it is not always the only way to accomplish a goal. Local people and BR practitioners might simply agree on the decisions made by the researchers and that can be enough and satisfactory for all the stakeholders. It might be more practical for the local residents, BR practitioners, and researchers to be indirectly involved in the same initiative. My findings suggest that such an approach to collaboration is especially preferred by the researchers and BR practitioners, during the biodiversity conservation initiatives. Snow (2001) points out that collaboration can be eliminated when the conservation issue is of a small size or significance. In any case, the BR welcomes research on the site; therefore, BR practitioners expect to be informed about the findings.

Researchers might ask different questions and find a new gap in knowledge, once collaborative relationships are well established. Even indirect engagement of the BR practitioners and local residents, when research tasks are not performed together, ensures equity and participatory democracy (Berkes, 2004). That indirect engagement also provides researchers with a broader perspective of the situation.

Defining respective roles and responsibilities of the BR practitioners and researchers is an important condition for the collaborative relationship to succeed. This research study revealed that the closeness by which researchers and BR practitioners work together depends on the initiative. Nevertheless, both researchers and BR practitioners are responsible for assisting each other if necessary, and for sharing benefits, costs, power, and responsibilities (Lockwood et al., 2006; Berkes, 2004).

The initial stage of the initiative, where goals are set and planning takes place, can have different approaches concerning collaborative relationships. This study revealed that an initiative where a sustainable development function was performed required close collaboration between researchers and BR practitioners, and involved joint planning and decision-making. At the same time, in the case of the RLBR, researchers and BR practitioners working on biodiversity conservation and logistic support functions approached this stage of the initiative separately. Nevertheless, researchers had to ensure regular communication (Stoll-Kleemann & Welp, 2008) with the BR practitioners, during all three projects.

For the initiatives where researchers are technical experts, it is important to trust, respect, and understand each other's background in order to have effective collaboration. Researchers are responsible for providing recommendations and required support to the BR practitioners and

local residents. Combined knowledge and experience will then have positive results and actors will be able to solve complex problems, adapt to the emerging situations, and progress (Burbidge et al., 2011; Krishna et al., 2002; Lockwood et al., 2006).

This research study confirmed that it is the BR practitioners' responsibility to make sure that the needs of local residents are taken into consideration. Findings suggest that the structure of the board, where members of all Rural Municipalities represent the entire BR region, makes such consideration possible. Once the right structure of the BR is arranged, the general public can be updated with the activities happening in the territory of the BR. It will not only strengthen the sense of belonging among the local residents, but also will ensure that trust is being built with the researchers.

This research study revealed that understanding of local knowledge is in the hands of the BR practitioners, when it comes to the matter of passing this knowledge on to the researchers. This is why it is also important that BR practitioners have community support. At the same time, it is the researchers' responsibility to ensure that local knowledge is considered during the course of the project's implementation.

In the case of the RLBR, I found out that when most of the research tasks are performed separately during the project's implementation, as in the case of the studies on White-Winged Scoters and the assessment of community capacity, BR practitioners' roles and responsibilities are to assist researchers. BR practitioners play an important role in providing necessary documentation and office space, in introducing the researchers to the key informants, and in helping to arrange other logistics. My findings suggest that direct and indirect collaboration between researchers and BR practitioners must always be present, whatever the nature of the initiative.

The study revealed that while setting clear goals and planning together set the stage for the initiative, evaluating or verifying the results together helps to keep track of the progress. Therefore, it is essential that both parties make the decisions and/or reflect critically on the progress during the implementation of the initiatives. When the initiative is focused on biodiversity conservation and does not require frequent collaboration with the BR practitioners, to review the results is sufficient. Findings suggest that this reviewing does not take much of the BR practitioners' time, and at the same time ensures that BR practitioners are informed.

It is the BR practitioners' responsibility to reach out and strengthen the collaborative relationships with external agencies. Researchers have to become familiar with the concept of a BR and its mandate. Consequently, research revealed that an active presence of the researchers on the site helps to identify the gaps in knowledge and to provide information on how the issues can be resolved.

My findings suggest that it is important to show to local residents the importance of the collaborative relationships with external agencies. When local residents understand the opportunities associated with collaboration, their willingness to collaborate will grow even stronger.

5.4. Factors for Effective Collaboration

In order to learn how researchers and BR practitioners can collaborate effectively, the factors of collaboration were drawn from the literature and further evaluated by the individuals who worked under one initiative (refer to Tables 6.1 and 6.2). But this research has also identified six new factors that were important to consider (see Table 8).

Table 8: Revised table of the factors of effective collaboration between researchers and BR practitioners. Additional factors, as a result of this thesis, are italicized.

Factors of Collaboration	Source
<i>Researchers' understanding of the BR concept</i>	Interview
Setting and/or agreeing on the goals for the project together	Literature review and interview
Planning the project together	Literature review
Adequate finances	Literature review
Trust	Literature review
<i>Mutual respect of different backgrounds</i>	Interview
Communication and information exchange	Literature review
<i>Openness to new ideas and local input</i>	Interview
Performing research tasks together	Literature review
<i>Verifying and/or informing results</i>	Interview
Making decisions together	Literature review

<i>Critical reflection and/or review of results</i>	Interview
Gained knowledge and understanding	Literature review
New and improved relationships	Literature review
<i>Support of institutions</i>	Interview

These factors nuance literature about the nature of collaboration for multi-stakeholders' relationships. The emphasis is put on shared respect among researchers, BR practitioners, and local people, rather than on shared labour. This is demonstrated through the factors such as 'openness to new ideas and local input', 'verifying and/or informing results', and 'critical reflection and/or review of results'.

Research has also revealed that researchers need to be aware of the circumstances where they work, and how by that work, they inform local people of their local circumstances. This is a two-way relationship. Therefore, 'researchers' understanding of the BR concept' was also important to consider. Also, both researchers and BR practitioners agreed that 'mutual respect of different backgrounds' was one of the key elements of successful collaboration. No matter what credentials stakeholders had in all three projects, they managed to communicate on the same level. And at last, 'support of institutions' was mentioned as an integral factor for initiating and continuing the development of an initiative. This is mainly achieved through financial support, expert knowledge, and use of the facilities necessary for the research.

5.5. Opportunities and Challenges

This research revealed that collaboration is an integral part of the BR's development. Findings suggest that new opportunities occur as a result of a collaborative relationship with other agencies, such as Environment Canada, Ducks Unlimited Canada, Sask Watershed Authority, and the University of Saskatchewan. Due to the financial limitations of the organization, collaboration appears to be one of the few possibilities available to pursue research or any other initiatives. Therefore, it is important for the RLBR to have a strong outreach function and associated activities, which will lead to finding new opportunities from the outside of the organization. Practitioners are tasked to find a mutual point of benefit with the representatives of NGOs, governmental agencies, and academia, in order to enhance collaboration and lessen financial limitations.

Based on the analyses conducted, BR practitioners' willingness to collaborate enhanced the community capacity of the RLBR. Information and knowledge derived from the collaboration were essential for the BR's development. Collaboration with researchers helped BR practitioners to find solutions to some of the issues present on the site.

As suggested by Stoll-Kleemann and Welp (2008), one of the challenges faced by BRs is a lack of time and financial resources. The findings of the RLBR case study confirmed that time devoted to the operations of the organization is limited, due to the lack of funding necessary to support permanent staff. I found that it is the personal motivation of the BR practitioners that helps them to seek new opportunities and to make the organization move forward.

My findings suggest that improved knowledge and understanding, as well as new and stronger relationships, are the main opportunities that lie behind collaborative relationships and cannot be achieved unless researchers and practitioners work together, at least to some degree. As noted by Lockwood et al. (2006), public communication and collaboration are central factors in achieving conservation results. The exchange of knowledge and information occurs through bridging organizations and networks (Schultz & Lundholm, 2010), the role of which is also emphasized by the Madrid Action Plan (2008).

Analysis suggests that collaboration assists in getting the word out to the public and potential partners. More publicity informs future researchers about the concept of a BR and might help them to realize the benefits of collaboration with BR practitioners.

CHAPTER 6: CONCLUSIONS

6.1. Introduction

The purpose of this study was **to understand how researchers and biosphere reserve practitioners can collaborate effectively, in order to achieve biosphere reserve objectives**. This research suggests that effective collaboration between both groups requires a more nuanced understanding of the process of collaboration. While all of the defined factors are important to a certain extent, effective collaboration differs according to the type of research being undertaken. The factor of “researchers’ understanding of the BR concept” is an essential part of effective collaboration that takes place in a BR and must be present at all times. This factor of collaboration makes it easier for both sides to realize the respective roles and responsibilities of each other, and thus to act to fulfill them. It is also important to note that three different projects evaluated in this thesis required different levels of collaboration, and that both researchers and practitioners agreed that working together was not obligatory during all the stages of project-formation and implementation.

6.2. Objectives Addressed

This thesis meets defined research objectives (Chapter 1) by using described research methods (Chapter 3). The research objectives are as follows:

- To develop an operational definition of collaboration that effectively integrates participation of researchers and BR practitioners;
- To learn the respective roles and responsibilities of researchers and BR practitioners in a collaborative process;
- To assess opportunities and challenges of collaboration between researchers and BR practitioners.

These research objectives were met in the following ways. First, I reviewed literature that was relevant to BRs and collaborative management, in order to become familiar with the concepts, functions and mandate of the BRs, and to understand the distinguishing characteristics of collaborative management (Table 1). Information extracted from the literature review assisted

in preparing preliminary factors of collaboration (Table 6) that were to be evaluated by the key informants and that helped to formulate other interview questions.

Furthermore, I conducted interviews with researchers and BR practitioners who were actively involved in a process of implementing the selected projects. Participants ranged from local residents to experts in the field. Key informants provided their views on efficient collaboration and what they need to have present in a successful researcher-practitioner working relationship (Table 4). A broad range of interview questions helped to identify economic, ecological, social/demographic, and governance/operational issues (Chapter 4.2). These pressing issues allowed me to look at the respective roles and responsibilities, opportunities, and challenges from a more systematic perspective.

An operational definition of collaboration (Objective 1) was developed with the help of literature on collaborative management and from amalgamated feedback from the interviewees. Theoretical knowledge and empirical observation contributed to the definition. Collaboration between researchers and BR practitioners was defined as **a dynamic process, when both parties work together for a mutually beneficial purpose, take into consideration each other's circumstances and needs, and produce measurable outcomes**. This is an original definition that derived from the literature review and from interviews with practitioners and researchers working in the BR.

The experience of the participants during a project's implementation assisted in identifying their respective roles and responsibilities (see Table 7), as well as what key lessons were learned and outcomes achieved. Based on the analysis conducted, roles and responsibilities of the researchers and BR practitioners could be identified and compared among three different initiatives, according to the functions of the BR (Objective 2).

Further, with the help of reviewed literature, general opportunities and challenges were pre-identified (Chapter 2.4.). Interviews provided a more case-specific view on opportunities and challenges that are faced by researchers and BR practitioners (Objective 3). Findings illustrated that collaboration between researchers and BR practitioners is important and is supported by both sides, while one of the main challenges is financial instability of the BR.

Both the literature review and interview feedback contributed to the final revision of the factors required for successful collaboration between researchers and BR practitioners (Chapter

5.4.). These sources suggested six additional factors for collaboration that thereby cohere with the purpose of this study.

5.6.2. Limitations.

There are several limitations to this thesis that should be taken into consideration. The capacity of the research study was limited to three initiatives in one BR. The reader should keep in mind that despite the identified factors of collaboration, there is a possibility that other initiatives or locations might have special requirements and consequently, may produce somewhat different results (see also Berkes, 2007).

Evaluation of the factors of collaboration was important in order to understand the importance of the implementation of the factors in practice from the perspectives of researchers and BR practitioners. At the same time, it is important to note that every participant had his/her own understanding and interpretation of each of the factors and would not consider the full spectrum of variables affecting the importance of the factor. It should also be noted that the weight (1-5) of 'importance' that each individual used as a rating should be considered an approximation, rather than an absolute value. Additionally, the sample size of the interviewees, who evaluated the importance of the factors, is small: therefore the results might be different once transferred to larger collaborative research projects or other sites. That is why it was crucial to support findings with the literature reviewed and other contributions from colleagues familiar with the topic. The findings are case-specific, and it might be necessary to include or omit various factors of collaboration.

5.6.3. Contributions.

In the course of this research, a more nuanced understanding of collaboration was realized. This study contributed to our better understanding of collaborative relationships between researchers and practitioners in a BR setting. The study revealed that effective collaboration differs, according to the type of research being undertaken.

Better understanding of the requirements, opportunities, and challenges of successful collaboration helps to build effective collaborative relationships between researchers and BR practitioners. Combining factors of effective collaboration from theory and practice makes a conceptual contribution to research that is concerned with collaborative management at BRs and

with other types of collaborative conservation or sustainability initiatives. It is hoped that the findings will also be of interest and help to researchers working at BRs and to BR practitioners, who welcome and collaborate with researchers.

This research also added six new factors of collaboration to those pre-defined from the literature review (Table 6.1 and 6.2.). They are as follows: “researchers’ understanding of the BR concept” that is usually lacking among researchers whose studies are focused around biodiversity conservation function; “mutual respect of different backgrounds” that is especially important to remember when an initiative requires close collaboration between researchers and BR practitioners; “openness to new ideas and local input” that ensures participatory democracy; “verifying and/or informing results” factor that was revealed to be essential when tasks were performed separately during the research process; “critical reflection and/or review of results” that help(s) to progress in the right direction and to ensure the inclusiveness of both sides, thereby strengthening collaborative relationships; and finally, “support of institutions” is integral to an initiation and support of collaborative relationships.

5.6.4. Future research opportunities.

In this thesis, I focused on one initiative for each of the functions of a BR. However, it would be useful to look at more than one project for each of the functions and examine any differences and similarities. This would lead to other questions. One could ask, is there one efficient way of collaborating for each of the functions? Can we suggest that certain initiatives require different environmental governance models? What position should local residents take, concerning research at the BR? As well, it would be beneficial to look at the collaboration across the World Network of Biosphere Reserves, nationally and internationally. What opportunities and challenges are present and how should they be addressed?

All in all, the findings indicate that effective collaboration in BRs is possible and desired by both researchers and BR practitioners. Although consideration and implementation of the factors of successful collaboration are essential, the willingness to develop a strong and long-lasting collaborative relationship will not develop, without the motivated and devoted members of a BR.

Appendix A: List of codes used for analysis of data collected.

Theme	Subtheme	Subtheme
RLBR	Personal involvement with the BR	
	Vision and goals in practice	
	Regional issues	
	Operational challenges	
	Actions to alleviate issues	
	Partner organizations	
	Missing partner organizations	
	Activities of the organization	
	Inclusion	<i>Aboriginal</i>
		<i>Local businesses</i>
		<i>Local citizens</i>
		<i>Membership “friends of the BR”</i>
		<i>Experts</i>
		<i>Youth</i>
	Project’s prioritizing	
	WNBR and RLBR	
	Roles	
	Responsibilities	
Collaboration	Definition	
	Key elements	
	Strategies	
	Opportunities of collaboration	
	Challenges of collaboration	
	Factors of collaboration ³	
Governance	Decision-making	
	Structure	<i>Pros</i>
		<i>Cons</i>
AEGP	Purpose	
	Importance	
	Decision-making	
	Initiation	
	Roles & Responsibilities	
	Outcome (accomplishment)	
	Key lessons	
	Collaboration	<i>Rating and reasoning</i>
ACC	Purpose	
	Importance	
	Decision-making	
	Initiation	
	Roles & Responsibilities	
	Outcome (accomplishment)	
	Key lessons	

³ Refer to the Appendix B

	Collaboration	<i>Rating and reasoning</i>
WWS	Purpose	
	Importance	
	Decision-making	
	Initiation	
	Roles & Responsibilities	
	Outcome (accomplishment)	
	Key lessons	
	Collaboration	<i>Rating and reasoning</i>

Appendix B: List of factors of collaboration.

Evaluated factors of collaboration drawn from the literature	Recommendations of the interviewees
Setting clear goals for the project together	Agreeing on the goal
Planning the project together	
Adequate finances	
Trust	
Communication and information exchange	
Performing research tasks together	
Monitoring together	
Evaluating results together	Verifying the results
Making decisions together	Critical reflection/ review
Gained knowledge and understanding	
New and improved relationships	
	Support of institutions

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